AARC Times
An Official Publication of the American Association for Respiratory Care
December 2012 Vol. 36, Issue 12 www.aarc.org $10.00

TB Prevalence Around the World

Kookhyun Lee, MD: Improving Patient Care in South Korea

MEDICAL MISSIONS SAVE LIVES

Kookhyun Lee, MD, received the 2011 Hector Leon Garza International Award at the 2011 AARC Congress.

New Shiley™ neonatal and pediatric tracheostomy tubes*

CLINICIAN-INSPIRED SOLUTIONS

[FOR MORE INFORMATION VISIT WWW.COVIDIEN.COM/NEWSHILEYPED13]

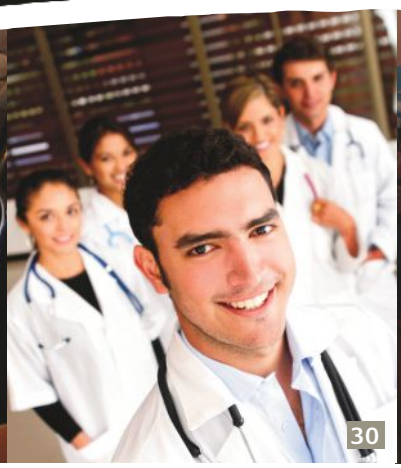
COVIDIEN

positive results for life™

*FDA 510(k) clearance pending

Table of Contents

December 2012
Volume 36, Issue 12



Cover photo by Lennie Sirmopoulos, Convention Photography, Tustin CA

AARC Strategic Plan

AARC Vision/Mission Statement: The American Association for Respiratory Care (AARC) will continue to be the leading national and international professional association for respiratory care. The AARC will encourage and promote professional excellence, advance the science and practice of respiratory care, and serve as an advocate for patients, their families, the public, the profession, and the respiratory therapist.

AARC Strategic Objectives

• Validate the science of respiratory care and the value of the respiratory therapist (RT) in providing respiratory care by supporting, conducting, and publishing research information.

• Promote respiratory therapists as the best providers of respiratory care by assuring that the science that clarifies the value and role of the RT is provided to those stakeholders whose decisions and actions need to be guided by that information.

• Promote respiratory therapists and the American Association for Respiratory Care by developing and implementing promotion and marketing campaigns targeted to unique audiences.

• Assure the Association has the resources to meet the needs of its members and that the AARC has the needed financial, volunteer, and staff resources needed to accomplish the implementation of the strategic plan of the Association.

The complete version of the Association's Strategic Plan is available to AARC members online at www.aarc.org/members_area/resources/strategic.asp.

Editor
Marsha Cathcart, BA

Assistant Editor
Karen Singleterry, BS

Contributors
Debbie Bunch, BA
Sheila Henegar

Art Director
Donna Knauf, BA

Graphic Designers
Jeanette Chawdhury, MBA
Lisa Dudley
Kelly Piotrowski

Consultant
Sherry Milligan, MBA, CAE

Director, Advertising Sales
Tim Goldsbury, BA, RRT
Goldsbury@aarc.org

Advertising Sales Consultant
Andrea Conté
andrea@aarc.org

Advertising Rates and Media Information
Contact: Goldsbury@aarc.org
Tim Goldsbury, 725 N. Highway A1A, Ste. C-106, Jupiter, FL 33477
Voice (561) 745-6793
Fax (561) 745-6795

Advertising Materials
Send production materials for AARC publications to Binkley@aarc.org or AARC 9425 N. MacArthur Blvd., Ste. 100 Irving TX 75063 c/o Beth Binkley
Voice (972) 243-2272
Fax (972) 484-2720

AARC Times and Respiratory Care — official publications of the AARC

Daedalus Enterprises, Inc.
9425 N. MacArthur Blvd., Ste. 100
Irving, TX 75063
(972) 243-2272
Fax (972) 484-2720

Director of Business Development
Dale L. Griffiths, BA

Publisher and Managing Editor
Thomas J. Kallstrom, MBA, RRT, FAARC

BPA INTERNATIONAL

Printed in USA

Meet the AARC Staff

Sherry Milligan
Associate Executive Director
milligan@aarc.org

Timothy Myers
Associate Executive Director
myers@aarc.org

Debbie Bunch
Writer
debbunch@aol.org

Cheryl West
Director of Government Affairs
west@aarc.org

THE TRI-ANIM ADVANTAGE

With over 30 years of experience, Tri-anim has developed a deep commitment to medical providers and healthcare excellence. We are inspired by our customers and the services they provide. We support hospitals and other advanced patient-care facilities by providing the innovative products needed to drive high quality of care and positive patient outcomes.

FAST, EASY $EtCO_2$ and SpO_2 MONITORING FROM NONIN MEDICAL

Nonin Medical's RespSense™ capnograph and LifeSense® capnograph/pulse oximeter are highly portable, accurate and easy to use. They can be used with intubated and non-intubated patients, from infants to adults.

Nonin capnographs provide fast, first-breath detection of respiratory rate and end-tidal CO_2. This makes them beneficial for use during:

- Procedural sedation
- CPR/resuscitation
- Intra-hospital patient transport
- Post-operative monitoring
- Pain management monitoring

For more information, contact your Tri-anim Account Manager or call 800.874.2646.

NONIN
Leaders in Noninvasive Medical Monitoring

Tri-anim® 800.874.2646 | www.tri-anim.com

AARConnection . . .

maximizing your membership

Share Your Research

The AARC Open Forum is a great place to present the results of your original clinical research. We hosted 20 Forums at AARC Congress 2012 in New Orleans and anticipate just as many next year at AARC Congress 2013 in Anaheim. Start brainstorming study ideas now and then use our Easy Street portal to submit your completed abstracts by June 1, 2013. **Find it at** http://www.rcjournal.com/open_forum/

Need End-of-Year CRCEs?

If the deadline to fulfill your CRCE requirements for state licensure is quickly approaching and you find yourself coming up short, we have the answer. The AARC offers a number of online courses for AARC members, and many of them are available free of charge as well. **Get started at** http://www.aarc.org/education/aarc_crce/

Your Dollars Matter

The American Respiratory Care Foundation supports a wide range of scholarships and research grants for respiratory care professionals, but they couldn't do it without the generous support of everyone in the respiratory care industry — including you, the individual member. As we enter the season of giving, consider giving to your professional foundation. **Do it right online at** http://www.arcfoundation.org/support/

Support Administrative Decision-making

Hospitals are increasingly using benchmarking to fuel administrative decisions, but the proprietary systems they often turn to can fall short when it comes to respiratory care. AARC Benchmarking was developed by RTs for RT departments and can help you provide accurate data, identify best practices, and ensure your department is fairly compared to peers. **Learn more and subscribe at** http://www.aarc.org/resources/benchmarking/

Follow Us on Twitter and Facebook.

Visit www.AARC.org

Information Contacts:

AARC Membership or Other AARC Services:
American Association for Respiratory Care • 9425 N. MacArthur Blvd., Ste. 100, Irving, TX 75063 • (972) 243-2272 • Fax (972) 484-2720 • www.aarc.org

Respiratory Therapist Certification & Registration:
National Board for Respiratory Care • 18000 W. 105th St., Olathe, KS 66061-7543 • (913) 895-4900 • Fax (913) 895-4650 • www.nbrc. org

Accreditation of Education Programs:
Commission on Accreditation for Respiratory Care • 1248 Harwood Rd., Bedford, TX 76021-4244 • (817) 283-2835 • Fax (817) 354-8519 • www.coarc.com

Grants, Scholarships, Community Projects:
American Respiratory Care Foundation • 9425 N. MacArthur Blvd., Ste. 100, Irving, TX 75063 • (972) 243-2272 • Fax (972) 484-2720 • www.arcfoundation.org

AARC Times **(USPS 491-930)** (ISSN 0893-8520) is a monthly publication of Daedalus Enterprises, Inc., for the American Association for Respiratory Care.

Periodicals Postage: Paid at Irving, TX, and at additional mailing offices. POSTMASTER: Send form 3579 to *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706.

Change of Address: Six weeks' notice is required. AARC members should include their membership number when submitting an address change. Nonmember subscribers should provide old mailing label and new address. Send changes to *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706. Periodicals postage paid at Irving, TX.

Article and Feature Contribution: *AARC Times* welcomes AARC member contributions of feature articles and information for the regular departments. All materials should be submitted via email to Editor Marsha Cathcart at cathcart@aarc.org. Letters from members will be considered for publication if they relate to specific articles appearing in *AARC Times* within the last three months. Editorials may be published if they are of interest to the AARC membership. The editor reserves the right to edit letters and articles without changing their meaning in order to suit legal and space requirements.

Subscriptions: Annual subscriptions are offered to members of associations according to their membership enrollment as follows: 100–500 members/$80; 501–5,000/$71; 5,001–20,000/$33.40; over 20,000/$11.50. Individual subscriptions are available at the following rates: $89.95 per year (12 issues) in the United States or Puerto Rico; $109 per year in all other countries. Airmail postage is an additional $94 per year. Single copies, current and back issues, if available, are $10. Write *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Daedalus Enterprises, Inc., for libraries and other uses registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $1 is paid directly to CCC, 21 Congress St., Salem, MA 01970.

Safety in the Workplace

by Thomas J. Kallstrom, MBA, RRT, FAARC

Finding a work environment that is free from potential safety concerns may be elusive. By virtue of what the respiratory therapist does in the hospital, there is a potential for encountering safety issues that we must identify so that we can avoid them, use the proper protection, or change policy and procedure in the provision of care. The Occupational Safety and Health Administration's (OSHA) primary goal is to ensure the workplace is a safe workplace. In 1970 the Occupational Safety and Health Act was signed into law.[1] This law requires employers to provide their employees with working conditions that are free of known dangers. The Act created OSHA, which sets and enforces protective workplace safety and health standards.

We spend a lot of time rightfully protecting our patients but, perhaps, neglecting our own safety. Employee safety is essential if we are to provide the care necessary for our patients. With this in mind, I would like to let you know that the AARC Executive Office was invited by the National Institute for Occupational Safety and Health (NIOSH) last year to participate in a national survey that would specifically look at health and safety practices of respiratory therapists in the hospital environment. We were among 20 other professional health care organizations asked to be part of the survey. The survey sought to uncover types of exposure to chemicals as well as other relevant health care and safety issues, such as but not limited to: work schedules, exposure to chemical agents, exposure to aerosolized medications, exposure to infectious diseases, physical demands, workplace violence, stress, vaccinations, and safety and health perception. The survey is titled "NIOSH Health and Safety Practices Survey of Healthcare Workers: A Report of Survey Participants from the American Association for Respiratory Care (AARC)."

I would like to call out a few areas that as a member you may be interested to see. The survey was open to all members when the request went out in 2011. Eight hundred fifty-two AARC members took part in the survey. As with any survey, we need to first discuss its strengths and limitations.

about the author...

Thomas J. Kallstrom, MBA, RRT, FAARC, is executive director and chief executive officer of the AARC.

Strengths

- Largest cross-sectional survey of private and public sector health care workers conducted by the U.S. government that addresses health and safety practices and use of hazardous chemical agents.
- Findings are useful for surveillance of hazards, exposure controls, and barriers to their use; also useful for priority setting, assessing knowledge gaps, and health and safety promotion.
- A short recall period (seven calendar days) for most questions helped to increase accuracy of responses.
- Best practices guided the development and implementation of the survey to ensure the intent of survey questions was understood; to ensure the Web survey was easy to follow, read, and navigate; and to maximize member participation.
- Web survey showed images (examples of engineering controls, different types of respirators, and masks) to increase the likelihood of accurate responses.
- Information on completion status by organization and module were available in real-time during the survey.

Limitations

- Survey findings reflect the experiences and practices of the respondents and are not generalizable to all health care workers or to all AARC members.
- Study population was limited to professional organizations that maintain email addresses for their members and that agreed to collaborate with NIOSH on this study.
- Survey participants who have resources to belong to a professional organization may be more likely to be further along in their career, better paid, more educated, and more aware of health and safety issues.
- Response rate cannot be calculated because eligibility was based on whether or not invitees used specific hazardous chemicals as part of their job. Since the classes of chemical agents under study were specified in the invitation email, it is unclear who decided not to participate because they did not use any of the chemicals versus those who used them but decided not to participate for other reasons.
- Since this was a Web-based survey and participants were invited through an email invitation, those without an email address or without access to computers/Internet would not have been able to participate.
- Demographic information was not available for respondents who participated in one hazard module and elected not to continue and participate in the core module.
- Survey data are self-reported. Responses were not confirmed via observation, records, or other means.

Survey results

The survey brings about a lot of useful information that should be of interest for the practicing respiratory therapist or manager who may want to place safety of staff at a higher level. Samples from the survey:

- 76% of practicing RTs experienced a work-related injury, illness, or exposure in the past 12 months (most commonly stated were back pain, slip or fall, asthma, breathing problems, stress, and infectious disease exposure).
- Of those who had an infectious disease exposure, only 51% had it evaluated by a physician.
- 1% indicated experiencing a physical attack at work.
- 23% stated that in the past 12 months they had been verbally threatened, intimidated, or bullied on the job. Of those who were, 50% said this was from a co-worker and 50% from a patient.
- 93% indicated that they were somewhat or very satisfied with their job.
- 30% either did not know or stated that their institution does not provide them latex-free gloves.
- 87% indicated that they received a flu shot in the past 12 months.
- 61% stated that health and safety concerns influence their decision to stay working in the health care field.
- 88% indicated that they received adequate training from their employer to recognize health and safety hazards in their job.
- 52% always wear respiratory protection when administering tobramycin, amikacin, or colistin while 48% sometimes do.
- 19% indicated that they never received training on procedures for the safe handling of aerosolized pentamidine.
- The most common reason why they did not use protection was because it was not in their protocol (79%).
- 8% of the respondents stated that their hospital did not offer to do fit testing for respirators.

This is an interesting peek into the safety environment of the respiratory therapists' work environment in the hospital. You would assume that across the board all respiratory care departments practice the ultimate level of safety; but as this survey showed, this is not the case. While we cannot generalize from this survey, it does allow us to identify areas of potential concern and/or opportunity. Much of this information is not available elsewhere and should be useful in guiding health and safety promotion and future research. This information will also be appropriate for benchmarking and identifying areas that may need guideline development. The AARC thanks our members who took part in this survey. The entire survey will be posted on our website (www.aarc.org) for access by members only in the coming weeks. ■

REFERENCE

1. U.S. Department of Labor website. Occupational Safety and Health Act of 1970. Available at: www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=OSHACT&p_id=2743 *Accessed Oct. 19, 2012*

A Salute to our 2012 Corporate Partners

Since 1947, the AARC has been leading the effort to advance the respiratory care profession and promote quality respiratory health care. Working with our 50 state organizations, we have successfully advocated for the profession at the federal, state and local level.

The link between the respiratory profession and manufacturers is clear. If respiratory practice expands, so too does the economy for our industry partners.

As health care budgets shrink and patient care becomes increasingly complex, our mutual challenges become greater. The synergy of the corporate partner concept is an effective way to address those needs utilizing our combined skills and resources.

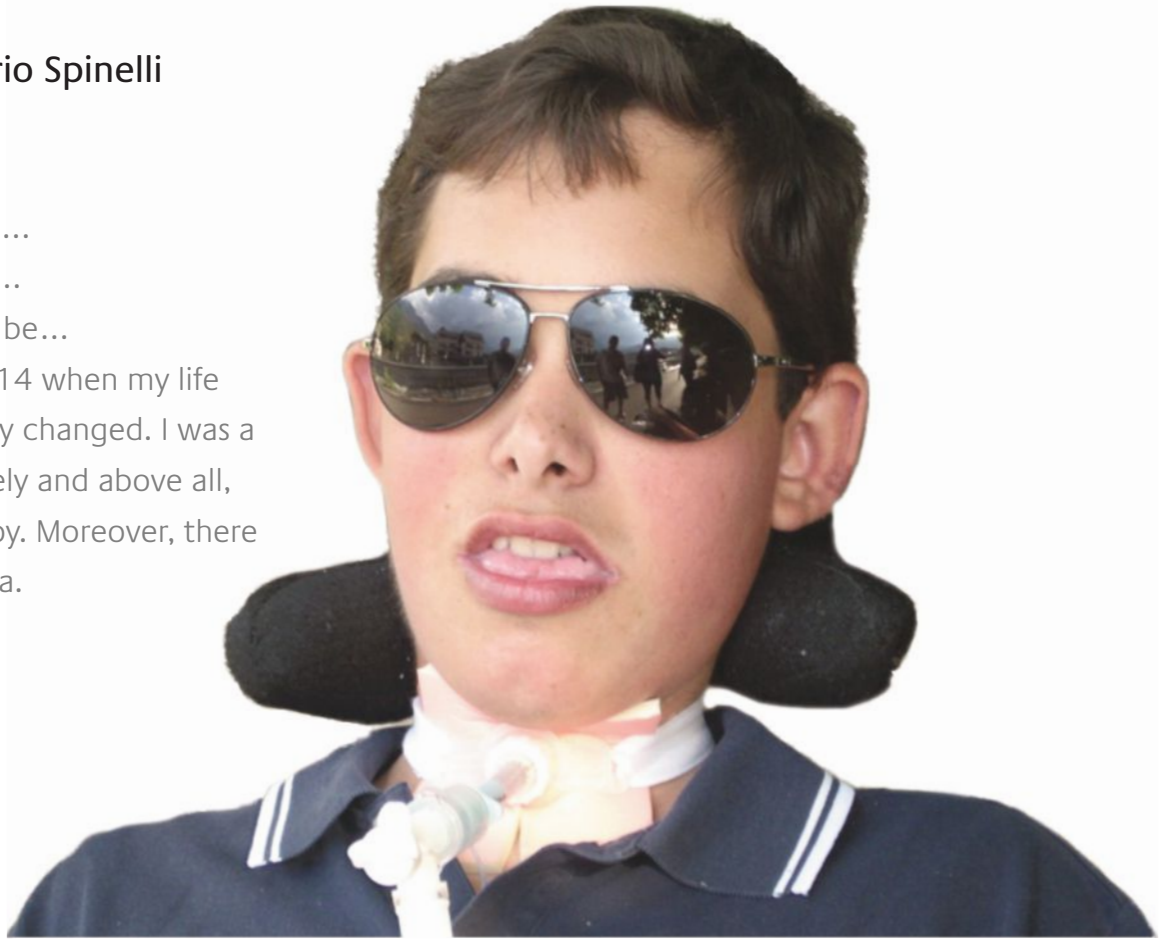
AMERICAN ASSOCIATION FOR RESPIRATORY CARE
AARC
CORPORATE PARTNER

CareFusion
Masimo
Covidien
monaghan
PHILIPS RESPIRONICS
Dräger
imagination at work
MAQUET GETINGE GROUP
Kimberly-Clark
Tri-anim
Teleflex

My Life with Mechanical Ventilation

by Valerio Spinelli

Who I was…
Who I am…
Who I will be…
I was just 14 when my life completely changed. I was a happy, lively and above all, healthy boy. Moreover, there was Thema.



Valerio Spinelli says he has come to think of his trach as a friend of sorts.

Thema was a somewhat crazy horse. She wasn't easy to ride. Indeed, I was the only one who could do it. When I rode her, I felt sprightly; I could fly on those jumps, always higher.

On March 27, 2007, I felt a tingling sensation in my left leg and arm. The day after, I was taken to the hospital to have a CT scan. A brain disorder called Arnold-Chiari malformation was the diagnosis.

After 10 days, I underwent surgery. In the following days I felt really bad. I complained about a very strong headache. The doctors told me that it was usual to have such a headache due to the surgical procedure I had just had. When I insisted that my pain was intense, they called it "moodiness" or even "depression."

Six days after surgery, I developed respiratory failure and lost consciousness. I had bulbar ischemia.

Sophisticated mobility equipment keeps Valerio on the move, but he longs for a medical breakthrough that could get him up and walking again.

That awful tube

One month later I woke up. I still remember my mother's face. She was bending over me, talking nonstop about Thema and gripping a felt horse in her hands.

I didn't understand what she was saying to me very well, nor did I know where I was. I tried to move and to speak, but nothing happened. All my relatives tried to reassure me — they asked me to be patient, to be very strong, but I was just a child. A very scared child!

Moreover, there was that tube coming out of my throat that made noise outside and inside me.

The alarms rang. Doctors rushed into my room. They took that tube out and slipped another, smaller tube into my throat. I was panic-stricken. I lacked air — wanted more than I could get. Then they set the tube again and I felt better.

Eventually I understood that the tube was keeping me alive, and it became somewhat of a friend. At that time, though, I didn't ask many questions because I was afraid of the answers.

24/7 ventilation

Five years passed. By then I had asked a lot of questions, and now everything was very clear. I was a quadriplegic and needed a ventilator 24 hours a day. That meant being dependent on everything and everyone.

It is not easy to live in such a situation of total dependence because you must rely on equipment that can break at any moment (this has happened to me many times) and the people who are taking care of you, hoping for their common sense whenever necessary.

My mother looks after me all day long. She was trained by the spinal unit in Milan with great success. She always knows what to do in the critical moments, and she can keep her temper and reassure me. But when my condition improves, I often hear her crying in the room close to mine. How this has changed my mother! When I was fine, she would worry even when I was a little bit feverish. Now she looks like a tower of strength, but I know she is going through hell inside. My father and my sister take care of me too, but they work a lot so they are out all day long. Sometimes we have another person to come in and help, as well.

Battling fear

I went back to school after my initial illness. I currently have completed the fourth year of scientific high school. I go to school with a caretaker named Martin,

who stays with me in the classroom, and my mother, who waits outside. She says that it is safer to have two people nearby if the ventilator and the electric equipment were to break.

Sometimes I meet my friends, but they usually come and see me, as I cannot stay out long in places where a power source is not available. I even have one in my car, which I can use during longer trips.

During the night I don't sleep much because I am alone with my thoughts, all the usual equipment noise, and my fears. I fear not to wake up anymore. I fear that my parents will sleep so soundly that they won't hear the alarms. I often call them, just to hear their voice. It makes me calm.

One year ago I had a diaphragmatic pacing device implanted, so I can breathe without the ventilator. Thanks to the pacing, I can ride a horse again. We don't have Thema anymore, but I can ride Funny, a docile horse with the same disabled guy's suffering and tiredness in her eyes. Maybe once she was lively, just like I was.

Thanks to a diaphragmatic pacer, Valerio is once again able to ride a horse.

A backyard swimming pool provides a convenient place for Valerio to undergo hydrotherapy.

A better chance

I don't know about the years to come. I have heard about stem cells being used to treat quadriplegics, and every day I search the Internet looking for some news. Someone told me that a very fit body can get up again. So, I train my muscles for six hours every day with some equipment my family bought. I even have a swimming pool in the garden for hydrotherapy.

In Italy, it is a luxury to be a disabled guy. All the equipment that helps me keep my body fit is very expensive. The Italian Department of Health doesn't contribute to these expenses. All the expenses are paid by my parents who, with many sacrifices, buy everything I need. It sounds weird, but many people say that I am a lucky guy!

I am very determined to do everything possible on my side, but I would like to ask the researchers to work hard to give me and others like me a better chance. ■

Valerio Spinelli is a respiratory patient living in Milan, Italy. Italian physiotherapist and 2000 international fellow Pamela Frigerio and Valerio's mother Angela Rossi worked with Valerio to bring his story to the readers of *AARC Times*.

Experience the freedom

The LTV® series ventilator—One ventilator, one circuit, multiple sites of care *(for patients 5 kg to adult)*

carefusion.com/LTV2012

CareFusion

Thank You, 2012 *AARC Times* Article Reviewers!

The *AARC Times* staff offers our heartfelt thanks to the people who reviewed the clinical articles in our publication throughout this year. Your special expertise and dedication to the respiratory care profession were critical to our ability to publish informative articles for the respiratory care professional. Thank you, reviewers!

Roger L. Berg, PhD, RRT-NPS
Lorraine Bertuola, BA, RRT
Shane Blake, MA, RRT-NPS
Suzanne Bollig, BHS, RRT, RPSGT
Richard Branson, MSc, RRT, FAARC
Walter C. Chop, MS, RRT
Kent Christopher, MD, RRT, FAARC
Robert C. Cohn, MD, FAARC
Kitty Collins, RRT
Gerilynn L. Connors, BS, RRT, FAARC
Jeffrey Davis, BS, RRT
Anthony L. DeWitt, JD, RRT, FAARC
Patrick J. Dunne, MEd, RRT, FAARC
Mark D. Eley, MS, RRT-NPS, RPFT
Richard M. Ford, RRT, FAARC
Charles S. Friderici, BS, RRT
William F. Galvin, MSEd, RRT, FAARC
Douglas S. Gardenhire, EdD, RRT-NPS, FAARC
Donna Gardner, MSHP, RRT-NPS, FAARC
Michael A. Gentile, RRT, FAARC
Melaine (Tudy) Giordano, MS, RN, CPFT
Sam P. Giordano, MBA, RRT, FAARC
Karen L. Gregory, MS, RRT, FAARC
Mary K. Hart, MS, RRT, FAARC
John D. Hiser, MEd, RRT, FAARC
Thomas J. Johnson, MS, RRT
Garry W. Kauffman, MPA, RRT, FAARC
Louis M. Kaufman, BS, RRT-NPS, FAARC
Felix Khusid, BS, RRT-NPS, FAARC
Debbie Koehl, MS, RRT-NPS, AE-C
Robert Nicholas (Nick) Kuhnley, RRT, FAARC
Douglas S. Laher, MBA, RRT, FAARC
Keith D. Lamb, RRT
Joseph Lewarski, BS, RRT, FAARC
Robert W. McCoy, BS, RRT, FAARC
Chuck Menders, BA, RRT
Rory Mullin, BS, RRT
Timothy R. Myers, MBA, RRT-NPS, FAARC
Natalie Napolitano, MPH, RRT-NPS, FAARC
Michael Nibert, BSRT, RRT
Lori A. Novotny, BS, RRT
Matthew O'Brien, MS, RRT, RPFT
William (Bill) Pruitt, MBA, RRT, FAARC
Christopher Randolph, MD
John W. Salyer, MBA, RRT, FAARC
Frank Sandusky, HCMBA, RRT
Karen S. Schell, MHSc, RRT-NPS, AE-C
Steven A. Schroeder, MD
Georgianna Sergakis, PhD, RRT
Steven E. Sittig, RRT-NPS, C-NPT, FAARC
Thomas Smalling, PhD, RRT, FAARC
Karla Smith, BS, RRT, RPSGT
Helen M. Sorenson, MA, RRT, FAARC
Greg Spratt, BS, RRT, CPFT
Anthony (Tony) Stigall, MBA, RRT, RPSGT
James K. Stoller, MD, FAARC
Charlie Strange, MD
Thomas G. Striplin, MEd, RRT, RPFT
Jay Taylor, RRT, TTS
Judy A. Tietsort, RN, RRT, FAARC
Sheri Tooley, BSRT, RRT-NPS, FAARC
Tara Vander Laan, BS, RRT-SDS, RPSGT
Teresa (Terry) Volsko, MHS, RRT, FAARC
Rhonda Vosmus, RRT-NPS, AE-C
Cynthia C. White, BA, RRT-NPS, FAARC
Nicholas A. Widder, RRT-NPS, CPFT, EMT-P
Kimberly S. Wiles, BS, RRT, CPFT
Dennis Williams, PharmD, AE-C

We Have Been Listening *To You!*

AARC Membership Dues Are Changing

And you have more choices than ever before . . .

Now you control how you read your publications and how much you save!

$78.50 Digital Level

You read RESPIRATORY CARE journal and *AARC Times* online each month. And you get the satisfaction of knowing you're being green. (If you have previously had the AARC Choice level, you are being billed for this option.)

$84.25 1 + 1 Level

You choose which publication you want to receive in the mail and which you'll read online.

$90.00 Print Level

Both publications come to you in the mail, just as they always have.

If you like to read online, you can save on your dues, support the AARC, and get all the benefits of membership in exactly the way you want to receive them.

Membership includes a subscription to *AARC Times* magazine and/or RESPIRATORY CARE journal at $11.50 each.

Watch for your dues renewal forms and new membership applications.

American Association for Respiratory Care (972) 243-2272 • www.aarc.org • email: info@aarc.org

INTEDA Helps Improve Aerosol Delivery in Turkey

by Arzu Ari, PhD, RRT, PT, FAARC

Inhaled medications are essential for the treatment of patients with pulmonary diseases. Over the years, numerous aerosol devices have been introduced and more are expected in the future. As the number of aerosol devices increases, discrepancies among the devices and confusion about each device also increase, and so the delivery of inhaled medications to patients requires optimum knowledge of aerosols in medicine and their delivery techniques. Since Turkish physicians and health care professionals are confronted with an ever-increasing challenge to match the aerosol device to the patient, developing a roadmap to improve the knowledge and practice on inhalation treatments was needed.

Vice President of the Turkish Respiratory Society (TRS), Dr. Can Öztürk, foresaw the importance of establishing the Inhalation Treatments Networking Groups (INTEDA) in order to develop a mechanism through its members to interact and collaborate on aerosol-related topics. In 2007, TRS assembled experts together for intensive work to clarify issues, formulate strategies, and develop action plans to continuously improve aerosol therapy. INTEDA was established under the wings of TRS and became the sole networking group currently focused on all aspects of inhalation treatments in Turkey. One of our greatest strengths is the mix of expertise and interests among its members. Physicians, scientists, and health care professionals with similar interests have been able to network and prepare guidelines, consensus statements, and policy documents related to inhaled medications and aerosol therapy.

In order to transform the initial enthusiasm into a practical reality, INTEDA board members developed several exemplary projects focused on publication, communication, international collaboration, research, and education, which are detailed here.

Publications

INTEDA has published two books, several peer-reviewed articles, and patient education documents since 2007. Last year, board members, Drs. Öztürk, Zafer Çalişkaner, Cenk Can, Sevgi Pekcan, and Emel Ceylan, worked together on a Turkish translation of American Association for Respiratory Care's "Guide to Aerosol Delivery Devices for Respiratory Therapists." The Turkish version of this guide can be found at www.irccouncil.org/newsite/members/documents/AerosolDeliveryGuideTurkishtranslation.pdf.

Also, Drs. Öztürk and Çalişkaner co-authored "Inhalation Treatments in Asthma and COPD" in 2009, which has been distributed to all the TRS members free of charge.

Communication through call center and website

TRS and INTEDA established a call center and website to streamline communication among all physicians and health care professionals interested in aerosol therapy. The call center is a first in Turkey at which patients' questions about inhalation treatments have been answered at no cost.

The website provides interactive patient education documents, information about aerosol therapy in children, correct inhalation techniques with each aerosol device available on the Turkish market, and information on common mistakes that affect the efficacy of aerosol therapy. All the documents provided at the website at

about the author...

Arzu Ari, PhD, RRT, PT, FAARC, is associate professor at Georgia State University, governor for Turkey on the International Council for Respiratory Care, and a member of the AARC's International Committee.

Postgraduate Education Programs

In the past two years I have taught a postgraduate education program titled "Clinical Applications in Mechanical Ventilation" at two different institutions in Turkey. The first program was offered at Mustafa Kemal University in Hatay through the support of Dr. Hasan Hallaçeli, program director of the School of Physical Therapy and Rehabilitation. Sanihe Uğurlu, of Memorial Hospital in Istanbul, Turkey — a recipient of the AARC 2012 International Fellowship Award — organized the second program.

The program was designed to teach clinical applications of mechanical ventilation to Turkish physicians and physical therapists seeking clinical excellence, professional distinction, and scholarly activities to contribute to the body of science. Both programs were approved by the International Education Recognition System, which was developed by the AARC International Council for Respiratory Care.

Through programs like this, it is possible for physicians and health care professionals to acquire knowledge on clinical applications of mechanical ventilation and enable health services in Turkey to produce better patient outcomes. ■

www.inteda.net are available free of charge to patients, physicians, and health care professionals.

International collaboration

We have established collaboration with the International Society for Aerosols in Medicine in order to prepare a two-day education program entitled "Basic Principles and Clinical Applications of Aerosols in Medicine" that will be held in Istanbul in June 2013. This organization of clinicians, researchers, and academics with shared interest in medical applications and developments of aerosol medicine will provide state-of-the-art lectures and opportunities for participants to better understand pulmonary diseases and aerosol therapy.

We are preparing a workshop in which expert speakers from Europe, the United States, and Turkey will present a range of topics on aerosols in medicine and foster further research and collaboration. Pediatric pulmonologists, clinical fellows in training, manufacturers, industry representatives, researchers, and health care professionals such as physical therapists, respiratory therapists, pharmacists, and nurses are expected to attend.

Research

INTEDA members have conducted two multi-center research projects. In the first study, Turkish physicians' knowledge and opinions about aerosol therapy in asthma and COPD, were evaluated with a prospective, cross-sectional multicenter survey study. The second study determined the errors made in the use of aerosol devices. Both research projects received the first place poster presentation award at the European Academy of Allergy and Clinical Immunology Congress in 2011.

These studies revealed that patient errors were classified as either "expected errors" (that are known as common mistakes made by patients) or "extreme errors" (that are developed by patients and not available in the literature).

Education projects

Over the past five years, INTEDA has organized a variety of lectures, symposia, workshops, and education programs on inhalation treatments not only for Turkish physicians and health care professionals, but also for patients and caregivers throughout Turkey.

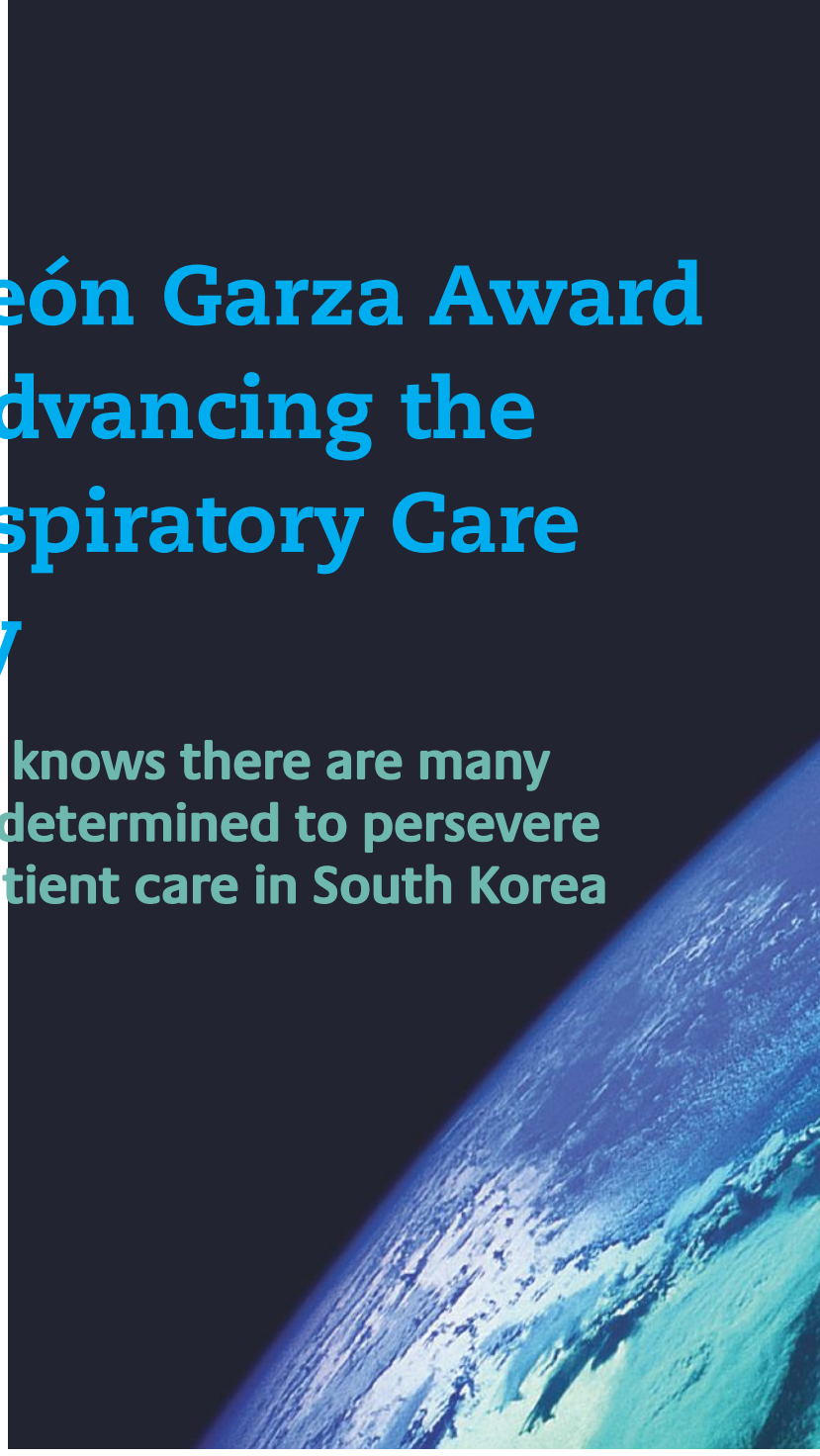
Improving care

In conclusion, INTEDA has evaluated all key issues of medical aerosols and promoted the improvement and consistency of inhalation treatments administered to patients. Once the assigned task is accomplished, INTEDA develops new projects, such as creating an informational document or standard, resolving problems related to inhalation treatments, and ensuring continuous improvement in aerosol therapy. None of these projects could have been accomplished without enthusiastic, outstanding individuals like Drs. Öztürk, Çalişkaner, Can, Ceylan, Pekcan, and all the other members of the organization. ■

Readers of the online version of *AARC Times* can click here for the Turkish translation of the AARC's "Guide to Aerosol Delivery Devices for Respiratory Therapists" or to view the TRS/INTEDA patient education documents.

2011 Héctor León Garza Award Recipient Is Advancing the Concept of Respiratory Care in His Country

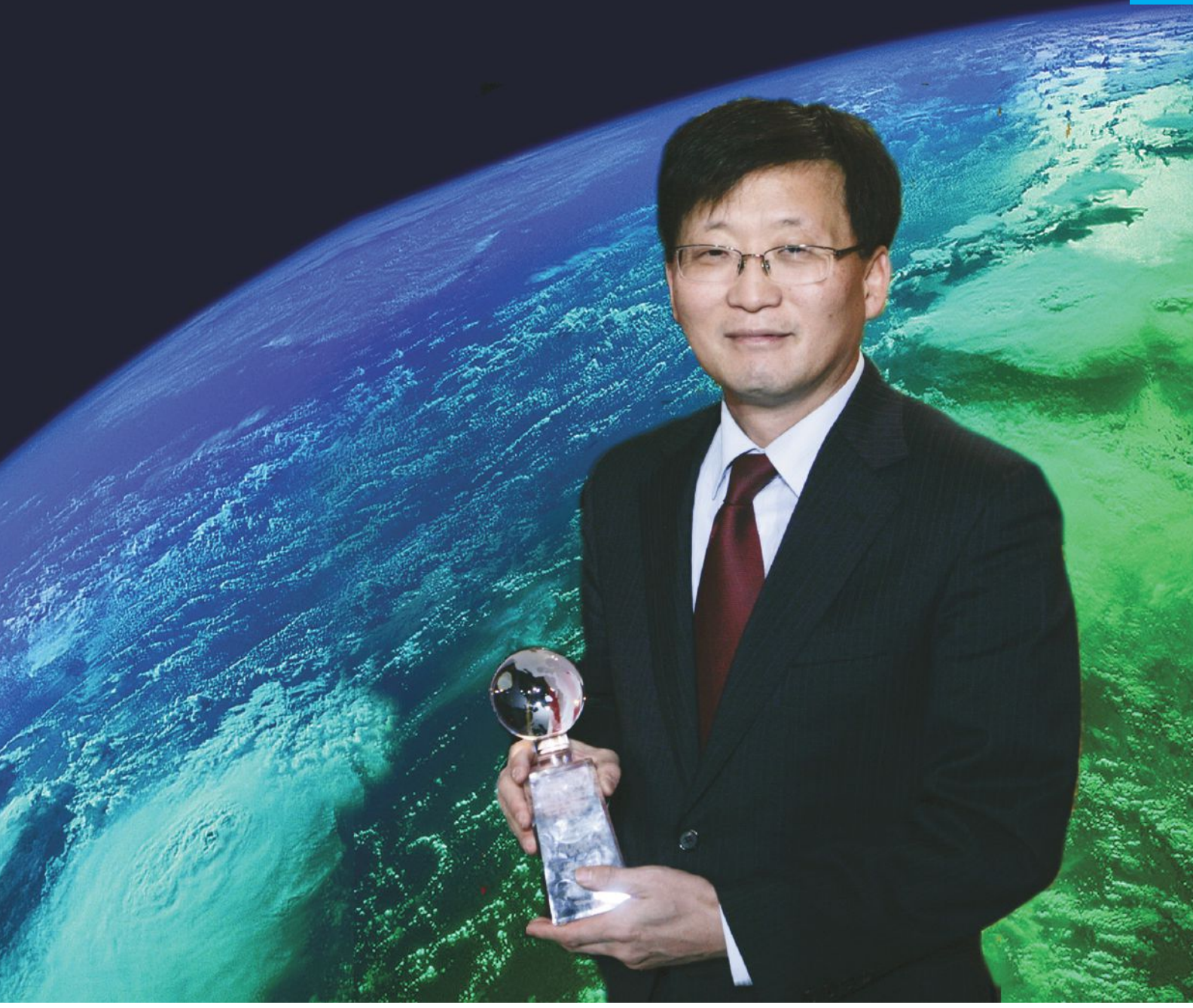
Kookhyun Lee, MD, PhD, knows there are many challenges ahead but is determined to persevere for the betterment of patient care in South Korea



Introducing the respiratory care profession in a country like South Korea, where clinical roles are well established and the medical system is resistant to change, isn't an easy proposition. However, last year's winner of the Héctor León Garza MD Achievement Award for Excellence in International Respiratory Care continues to make progress through an organization aimed at sharing information about the specialty and planning for the future.

AARC Times: Where do you work, and what are your primary responsibilities there?

Kookhyun Lee: I am currently a professor and chairman in the department of anesthesiology and pain medicine at Seoul National University (SNU) College of Medicine in South Korea. I also serve as the main anesthesiologist for the liver transplantation program in the SNU Hospital with more than 150 cases per year; this is in addition to an average of eight surgeries per day at the same hospital. Another area of my services includes lecturing to residents and senior students on various topics including perioperative respiratory care, airway management, and mechanical ventilation.



AARC Times: What are your main areas of interest in terms of research, and why have you decided to pursue studies in these areas?

Dr. Lee: Throughout the years, I have been involved in a number of research projects including but not limited to: extracorporeal lung assist (our first Korean successful case of ECMO was reported in the daily paper in 1990), intratracheal pulmonary ventilation and insulin effect on bupivacaine toxicity, and an animal experiment of artificial placenta (that was introduced by my research group). Most recently I am in the process of modifying an oxygen mask to be used during gastroscopy procedure. As an anesthesiologist, I think respiratory care is essential to physiologic researches as well as clinical application of new technology. Most of my research themes are related to these areas.

AARC Times: What led to your interest in the respiratory care profession?

Dr. Lee: After attending the Asia Pacific Association for Respiratory Care (APARC) of 1995 in Nagoya, Japan, I learned that respiratory care includes mechanical ventilation, airway maintenance, and aerosol therapy, which all are essential to a better outcome for critically ill patients. Being an anesthesiologist and covering the intensive care units in my country, I became very interested in exploring this new profession, new methodologies,

and practices. I also learned that care can be delivered at home for patients who do not require care in acute settings. It is my understanding that respiratory care is based on the fundamentals of physics, physiology, mechanics, and ethics. However, respiratory care has been regarded as a general job in Korean hospitals. Many physicians and nurses seem to be interested mainly in respiratory cure rather than respiratory care. By being exposed more and more to the profession of respiratory care, I realized that mutual communication and quality assurance through education is required to assure quality and safe patient care in our daily practices.

AARC Times: You were instrumental in the establishment of the Korean Association for Respiratory Care in 1999. Tell us about this group and what it has done to further the art and science of respiratory care in your country.

Dr. Lee: On July 31, 1999, about 150 physicians and nurses gathered to establish the Korean Association for Respiratory Care (KARC). We began to talk about respiratory care practices and plans for the future of this specialty area in our country. In 2000, the KARC hosted the ninth APARC Congress. Since then, KARC has held biannual symposia and workshops. In 2010, KARC celebrated its tenth anniversary. The two-day program was blessed with the participation of ICRC President Jerome Sullivan, PhD, RRT, FAARC, and ICRC Executive Committee Member Hassan Alorainy, BSRC, RRT, FAARC. Our most recent KARC meeting was held last July 21 and was attended by more than 360 members and participants; the meeting was also recognized by the AARC's International Education Recognition System (IERS). I hope to continue to introduce respiratory care to Korean practitioners through the activities of the KARC.

AARC Times: You were an AARC international fellow in 2001. Why did you apply for the fellowship, and what did you learn that you were able to put to use back in your country?

Dr. Lee: I learned about the goals and objectives of the AARC international activities, which I found to be very noble. Therefore, I built communication and friendships with respiratory care professionals from the USA as well as from all over the world. I wanted to be more cognizant of the profession of respiratory care and to learn more about the crucial role of the respiratory therapist in the health care system. I also wanted to have first-hand experience of the structure of the respiratory departments in hospitals and to learn about the educational requirements. During the fellowship rotation, I had the opportunity to observe the actual practice of respiratory care in the acute setting in hospitals, chronic care units, and at home. I observed respiratory care procedures such as ventilatory management, pulmonary function testing, sleep studies, stress testing, airway management, and pulmonary rehabilitation. Having observed the actual role of respiratory therapists, I was able to establish a benchmark of what is required to establish respiratory care education programs in Korea.

AARC Times: What is the current status of the respiratory care profession in your country? How does your model of respiratory care differ from that used in the United States?

Dr. Lee: Respiratory care as a profession faces many challenges in the Korean health care system. Hospitals are concerned about both cost-effectiveness and improving quality of patient care. The national health insurance covers medical services to a minimum level, and hospitals cannot be reimbursed fully for the respiratory care even in ICUs. The insurance pays for oxygen, disposables, and equipment. The ICUs are generally considered a cost-consuming area. Arterial blood gas analysis, cardiopulmonary resuscitation, and bedside monitoring are shared procedures between physicians and nurses. Because the government controls the number of medical personnel, doctors and nurses want to be specialized from the point of daily work; however, advanced education is needed for those who want to be a specialist in respiratory care. According to staff needs, respiratory care teams can be generated by the base of medical departments. In Korea, most of the ICUs are managed by anesthesiologists. I believe that all departments must be flexible and cooperative in order for the respiratory care discipline to flourish in the Korean health care system.

AARC Times: As a member of the International Council for Respiratory Care (ICRC), you are helping open the lines of communication between respiratory specialists in the United States and abroad, including your country. Why do you think this is important?

Dr. Lee: During my AARC international fellowship, I realized the vital role of respiratory therapists and their involvement in patient care, which is difficult to find in textbooks. In 2003, I visited David J. Pierson, MD, FAARC, at Harborview Medical Center in Seattle, WA, for one month. My wife, two kids, and I have stayed at the home of Celeste Stubbs, RRT. I really appreciate her loving care and tenderness toward us. I observed many consistent bedside practices that need to be standardized and renewed at home through advanced education and leadership. Respiratory therapists take the initiative in adapting the evidence-based medicine that is challenging in many countries. I learned to become more flexible and open minded to discuss the patient care plan with other health care providers at the bedside. This year, Bill Pruitt, MBA, RRT, CPFT, FAARC, and his family came to Seoul. Last March I visited Dr. Ronald Sanderson, MEd, RRT, in Hawaii with great help from our friend Brian Oka, RRT-NPS, FAARC. Dr. Sanderson plans to visit my department this October. And Yu-Lan Fang, RRT, RN, is

coming to observe the latest anesthesia nursing model of care and continuing education. I believe mutual understanding and support from all involved parties is vital to set up the right model of respiratory care in my country.

AARC *Times*: Last year you received the Héctor León Garza award at the AARC Congress in Tampa. What has it meant to you to receive this prestigious international award?

Dr. Lee: I never dreamed of being nominated as the recipient of this prestigious award. I understand and appreciate what this award means. However, I cannot say I have earned this honorable award. This honor was more than I deserve. I felt humble because every year I just attend the AARC International Respiratory Convention to get the latest updates on respiratory care practice and to meet with international colleagues in respiratory care to compare notes and enjoy the friendship. After attending the AARC Congress, I usually gather ideas on topics and themes for the scientific program of our KARC meeting. I also introduce the AARC activities and encourage the KARC members to attend the AARC Congress and join programs. I believe respiratory care will continue to grow in South Korea. With international cooperation and mutual understanding, it will be my happy duty to make every possible effort to establish the *right model* of the respiratory care profession in Korea.

Finally, I would like to extend special appreciation to the AARC, ICRC, and the National Board for Respiratory Care for their many years of continuing support. I also must not forget to thank the essence of my life — my wife and two children — for bearing with me, my busy schedule, and frequent travels. ■

Volunteering Around the World

by International Edition Guest Editor
John D. Hiser, MEd, RRT, FAARC

vol·un·teer·ism
(vol-*uh* n-**teer**-iz-*uh* m) –
noun. **1.** VOLUNTARISM.
2. The policy or practice of volunteering one's time or talents for charitable, educational, or other worthwhile activities, especially in one's community.

Volunteerism by respiratory care professionals is alive and well throughout the United States. It is also alive and well among our colleagues throughout the world. I was recently reminded of this when I asked for volunteers from our past international fellows to write articles about respiratory care in their parts of the world for this issue. I was pleasantly surprised by the response.

Featured in this issue are articles about tuberculosis from Egypt, India, Lithuania, Paraguay, Peru, and Saudi Arabia. We also have articles to get everyone up to date on sleep-disordered breathing in India, Italy, Philippines, and Saudi Arabia.

ABOUT THE GUEST EDITOR

John D. Hiser, MEd, RRT, FAARC, chairs the AARC International Committee and is an AARC past president (2005). He is the director of the respiratory care program at Tarrant County College Trinity River East Campus Center for Health Care Professions in Fort Worth, TX.

Xiangyu Zhang, MD, PhD, FCCM, FCCP, an AARC fellow in 1998, volunteered his expertise to help victims of the West China earthquake.

Hui-Qing Ge (Grace), RT, an international fellow in 2010, teaches ventilator care in rural hospitals around Hanghou, China.

Since 1990, the AARC has welcomed 147 international fellowship recipients from 60 different countries and every continent except Antarctica: Africa (6), Asia (71), Australia (2), Europe (45), North America (5), and South America (18).

All but one of these 10 articles were written by past international fellows. Another past fellow helped arrange an article written by a ventilator-dependent patient from Italy. I know everyone will also enjoy the articles about medical mission trips AARC members have taken to Belize, Haiti, and the Czech Republic.

The number of international fellows continues to grow. This year, the AARC had 22 applicants from 18 countries, with applicants from seven countries that have never had an international fellow. I'm happy to report we selected fellows from three new countries: Ecuador, Ghana, and Haiti. We will also welcome fellows from China, India, and Turkey this year.

This issue features several other articles about improving respiratory care in different parts of the world. All of this is topped off by our cover story on Kookhyun Lee, MD, PhD, the 2011 Héctor León Garza International Award recipient, who has helped improve patient care in South Korea.

So, as you can see by this annual international edition of *AARC Times* and by the pictures included with this article of respiratory care professionals around the world performing community service, volunteerism is alive and well throughout the world. ■

Respiratory therapists in Saudi Arabia promote smoking cessation.

Noel Tiburcio, PhD, RMT, RRT-NPS, ICRC governor of the United Arab Emirates and a 2009 international fellow, volunteers with his colleagues in offering information on asthma management.

Respiratory Therapy in Colombia

by Liliana Chaves Palacios

Respiratory therapy developed in Colombia in response to the country's public health needs, which are influenced by a high incidence of cardiovascular and respiratory disease associated with increasing levels of environmental pollution, poor lifestyle choices, and adverse socioeconomic and weather conditions within the community.

The first respiratory therapy programs in Colombia were offered in the 1980s when universities developed solid academic curricula designed to train highly qualified professionals to meet the academic, scientific, and humanistic requirements inherent to the cardiorespiratory care of individuals, families, and the community.[1] Since then, the respiratory therapist has had a major impact on work environments, which in turn has influenced cardiorespiratory care and led this professional to be recognized as a key member of human resources at multiple levels of health care.

Professional training

The respiratory therapist's professional role in Colombia encompasses health promotion and disease prevention, along with the assessment, diagnosis, treatment, and rehabilitation of individuals with cardiorespiratory conditions or risk factors that could lead to those conditions.

Respiratory therapy education is offered at six private universities in Colombia. Today 1,100 students are engaged in undergraduate studies in respiratory care.

Within the curricular flexibility process, and in order to facilitate the national and international academic mobility of students and graduates,[2] the curriculum of the various programs in Colombia is expressed in academic credits ranging from 154 to 167, with total program duration of between 4–4.5 years.

Professional education at the various universities has been directed to:

- Achieve a comprehensive education that articulates the specific professional component as well as the fields of basic sciences, humanities, and research.
- Promote ethical values in students, following the legal guidelines and principles from the profession and the society.
- Develop critical thinking skills that enable relating, contextualizing, and analyzing cardiorespiratory problems.[3]

Curricular structure of academic programs

Study plans are organized by areas of training that meet specific purposes, facilitating the arrangement of courses into epistemological fields of knowledge, where relationships between curricular elements basically depend on a scientific basis. This leads to a more agile and flexible organization of the curriculum.[3] Students are trained in the basic sciences and take humanistic courses to promote comprehensive training in ethical, aesthetic, and social values.

The discipline-specific component covers all the bases in cardiorespiratory care, with courses in human anatomy and physiology, cardiorespiratory physiology, pharmacology, infectious diseases and immunology, general semiology, pulmonology, neonatal and pediatric pulmonology, cardiology, and otolaryngology. It also covers nephrology, bioengineering, cardiopulmonary laboratory, cardiopulmonary rehabilitation, basic and intermediate care, mechanical ventilator support, critical care medicine, home care, health promotion, and clinical practice.

A research component fosters the pursuit of new knowledge and its application, while a complementary component focuses on alternative therapies, entrepreneurship, health marketing, and occupational health. Lastly, respiratory therapy students may choose from a list of electives aimed at enhancing their development in artistic, cultural, and social areas.

All programs in Colombia encourage the development of generic and specific skills in students within different professional contexts. Below are some of the respiratory therapy skills defined on a national level:[4]

- Intervenes with the individual requiring cardiorespiratory care by applying guaranteed scientific and ethical methods established by the profession.
- Designs and implements therapeutic plans based on the clinical and functional assessment of the individual from a bio-psychosocial point of view.
- Performs and interprets monitoring and diagnostic procedures using cardiorespiratory tests.
- Designs and participates in rehabilitation programs for individuals with heart or respiratory disease.
- Intervenes with individuals and their environment with respect and dignity; protects the inherent characteristics of the human being, professional confidentiality, informed consent, and the patient's autonomy.
- Designs, implements, and monitors health services and programs, demonstrating leadership, creativity, and initiative within the work environments of the individual.
- Designs, develops, and evaluates health promotion and disease prevention activities that encourage healthy lifestyles.
- Develops research projects within disciplinary lines, contributing new knowledge to the cardiorespiratory area.
- Participates in the development of protocols and management guidelines in cardiorespiratory care, encouraging quality in patient care.

There are currently 4,980 respiratory therapy graduates from Colombian respiratory therapy programs, a significant percentage of which are now working on an international level.

Professional practice in Colombia

Respiratory therapists in Colombia have demonstrated a high-quality professional performance, intervening actively on behalf of patients whose clinical-pathological conditions require it. They provide cardiorespiratory care within outpatient services, hospitals, emergency rooms, ICUs, delivery rooms, sleep laboratories, cardiopulmonary laboratories, and rehabilitation and home care services. The services they provide include:

- Chest physiotherapy
- Aerosol therapy
- Oxygen therapy
- Laboratory testing
- Cardiorespiratory monitoring
- Measurement and analysis of blood gases
- Cardiopulmonary function and sleep tests
- Invasive and noninvasive diagnostic tests
- Cardiopulmonary resuscitation
- Maintenance of the artificial airway
- Management of invasive and noninvasive mechanical ventilation
- Cardiopulmonary rehabilitation
- Transport of critically ill patients.

At the community level, RTs create, execute, and lead programs aimed at health promotion and prevention of cardiorespiratory disease. They are also engaged in the development of public and occupational health programs.

Postgraduate education

After attaining their professional title, respiratory therapists in Colombia can access postgraduate education at the master's and doctorate levels. Postgraduate studies with the highest demand include critical care, cardiopulmonary rehabilitation, pediatrics, public health, bioethics, health management, occupational health, and university teaching.

Likewise, those who obtain a professional title in Colombia may attempt the Latin American certification exam in respiratory therapy, which provides added value through accreditation under international standards. This facilitates employment in member countries of the Latin American Council.

National associations backing the profession

At the national level, two major associations support the professional work of the RT. The first is the Colombian Association of Respiratory Therapy Faculties, which since its inception has become an organization of a scientific academic nature. The group has led several processes in accordance with its mission of contributing to the consolidation and excellence of teaching and extension of research activities developed by academic communities performing the discipline within the country.[5]

The second association-like organization is the Colombian School of Respiratory Therapists, a democratic corporation formed by respiratory therapy graduates across the country. The mission of the Colombian School of Respiratory Therapy is to ensure the profession is exercised according to legal and ethical standards, to promote a scientific exchange, and to defend the economic union interests based on the health system.[6]

Professional strength

Respiratory therapy programs in Colombia foster the theoretical and practical elements that ensure the achievement of abilities in students and professionals. They provide content that enables deepening, validated therapeutic processes for the treatment of cardiorespiratory pathologies and the interpretation of diagnostic tests. They support the implementation of evidence-based protocols and guidelines and the use of biomedical technology.

Professional strengthening of the respiratory therapist in Colombia has enabled social, academic, and professional recognition, building a concept of association that provides identity, support, and legitimacy from government agencies and academic and scientific associations. ■

REFERENCES

1. Servicio Nacional de Aprendizaje — SENA. Respiratory Therapy Occupational Characterization. Bogotá, Colombia. 2008.
2. Ministry of Education. Decree 1295, April 20, 2010. Decree which regulates the qualified registration and offer and development of higher education academic programs. Bogotá, Colombia. 2010.
3. Universidad Manuela Beltran. Self-assessment and high-quality accreditation, document of the Respiratory Therapy Program. Bogotá, Colombia. 2010.
4. Asociación Colombiana de Facultades de Terapia Respiratoria. Professional Skills of the Respiratory Therapist. Bogotá, Colombia. 2011.
5. Gonzalez J. Nubia Mercedes. Respiratory Therapy: A career in academic and labor positioning in national and international contexts. Tunja, Colombia. 2005.
6. Colegio Colombiano de Terapeutas Respiratorios. CCTR Statutes. Cali, Colombia. 2005

About the Author

Liliana Chaves Palacios is the health faculty director and respiratory therapy program director at Manuela Beltran University and vice president of the Colombian Association of Respiratory Therapists.

Aerosol Research *and*

Thanks to an alumna and a Georgia State University (GSU) International Strategic Initiatives grant, the division of respiratory therapy at GSU has formed an international research alliance to evaluate the effectiveness of aerosol medication delivery through different interfaces and equipment.

The international initiative research grant was awarded to Lynda Goodfellow, EdD, RRT, FAARC, and facilitated by Professor Robert Harwood, MSA, RRT-NPS, and Hui-Ling Lin, MS, RRT, RN, who graduated from GSU with a master's of science degree in respiratory therapy in 2005. Professor Lin is currently serving as a faculty member for the respiratory therapy program at Chang Gung University in Tao-Yuan, Taiwan. The grant allowed four GSU researchers to conduct a series of experiments using a spectrophotometer at Chang Gung University.

Three experiments

Chang Gung University is a private university with about 8,000 students located in northern Taiwan. Started in 1987 as the Chang Gung Medical College, it changed its name to Chang Gung University, and engineering, science, and technology programs were added. The respiratory therapy department was established in 1999 and was the first respiratory therapy program in Taiwan.

The RC research team included GSU Associate Professor Arzu Ari, PhD, RRT, FAARC, Adjunct Faculty Member James B. Fink, PhD, RRT-NPS, FAARC, Professor Harwood, and Professor Lin. In addition to her experience at GSU, Professor Lin has been mentored on aerosol delivery investigations by Dr. Fink.

The group conducted three experiments in the Chang Gung aerosol laboratory:

- Comparison of continuous positive expiratory pressure and continuous high-frequency oscillation with standard therapy on aerosol delivery using two different positions in a simulated adult lung model.
- The effect of flow rate, breathing pattern, and face mask type on aerosol drug delivery in simulated spontaneously breathing children.
- An analysis of the particle size of different nebulizers used in aerosol therapy by clinicians in Taiwan.

The research team is currently collaborating on a few research papers as a result of this exchange. They also conducted a research seminar to show how to begin aerosol research. The seminar included lectures and a

Lynda Goodfellow and Robert Harwood traveled to Taiwan as part of an international initiative grant to study aerosol medication delivery.

Education Alliance *in* Taiwan

hands-on workshop for rotating groups of Taiwanese RC students illustrating research models developed by the research team.

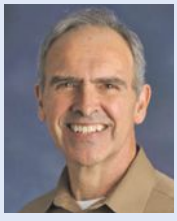
The team participated in a conference in Taichung, Taiwan, at the Respiratory Therapy Society conference at China Medical University, as well. This second conference was arranged by Chia-Chen Chu, MS, RRT, FAARC, considered to be the "father of respiratory therapy" in Taiwan, and was presented to society members and respiratory therapy students currently enrolled in the respiratory therapy program at the university. Their time in Taichung provided a rare glimpse into the inner workings of respiratory care in an international setting for the team from Georgia State University.

An exciting experience

Respiratory therapy is a relatively young profession and not yet well-known around the world. This trip was an excellent opportunity to see how it is becoming more and more recognized as a part of the international health care team. Meeting Professor Chu and learning how he started the credentialing process and how he is working with RTs in mainland China to establish a professional society and credentialing process was very exciting.

As an added bonus, through collaboration between Dr. Ari and Professor Chu, a memorandum of agreement was established between China Medical University and Georgia State University. Research results are expected to be the top byproduct of this experience. ■

Lynda Goodfellow, EdD, RRT, FAARC, is associate dean and professor of respiratory therapy in the Byrdine F. Lewis School of Nursing and Health Professions at GSU. She received the international initiative research grant that made the trip to Taiwan possible.



Robert Harwood, MSA, RRT-NPS, heads the respiratory therapy division at George State University in Atlanta, GA, and is a member of the RC research team that conducted experiments at Chang Gung University.

Tuberculosis and Man:
AN ETERNAL WORLDWIDE STRUGGLE

by Richard L. Sheldon, MD, FAARC

***Mycobacterium tuberculosis* (TB) loves *Homo sapiens* so much that it will make whatever changes it takes to be able to live inside man. Evidence of TB is seen in the earliest histories and to this day continues to alter man's existence on this planet.**

The study of TB (phthisiology from the word "phthisis," meaning to waste away) is thousands of years old and did not gain focus until Robert Koch discovered the bacillium in 1882. He won the 1905 Nobel Prize for this work.

A brief list of the many famous people who have died of TB would include Eleanor Roosevelt, Mohammad Jinnah, John Keats, Stephen Foster, Robert Burns, W. C. Fields, and my favorite, Dr. John Henry (Doc) Holliday. The entire lengthy list shows no respect for human rank, occupation, education, or geographic location.

The current public health problems caused by TB are daunting. The ease with which TB spreads is increased by poverty, population density, poor nutrition, ignorance, superstition, cultural bias, and pre-infection with human immunodeficiency virus (HIV), all of which are progressive worldwide issues. The World Health Organization (WHO) makes the following observations[1]:

- Someone in the world is infected with TB every second.
- One-third of the world's population is currently infected with TB.
- 5–10% of people who are infected with TB (but who are not infected with HIV) become sick or infectious at some time in their life. People who have HIV in conjunction with TB are more likely to develop the symptoms of TB. (*See Figure 1*)

Multi-drug resistance

As if the problems of blocking transmission and proper early diagnosis and treatment aren't enough, the worldwide problem caused by TB's emerging multi-drug resistance adds a new degree of difficulty in controlling this human scourge. There are an estimated 440,000 cases of multidrug-resistant tuberculosis (MDR-TB) identified each year, which have resulted in 150,000 deaths from TB that should have been curable. Extensively drug-resistant TB (XDR-TB) has a higher fatality rate and has been reported in more than 77 countries.

MDR-TB is TB that is resistant to isoniazid (INH) and rifampicin (RMP). XDR-TB is defined by the WHO as MDR-TB with additional resistance to any fluoroquinolone and to at least one of three injectable second-line anti-tuberculosis drugs used in treatment: capreomycin, kanamycin, or amikacin.[2]

The most frightening statistics occur in the patients previously treated for TB. The proportion of previously treated cases that become MDR is 51% in Belarus, 60% in Lithuania, and 65% in Moldova. In China, 26% of previously treated TB cases are now MDR. In Estonia, 19% of all MDR cases are now XDR. Meanwhile, India and Russia, two of the biggest contributors to resistant TB because of their size and the state of their health care systems, report resistant cases only on a local level, not nationally. Except for small areas, most of Africa is unable to measure cases of drug resistance to TB at all.[3]

The brightest areas of hope for the world eradication of TB come from private foundations such as the Bill & Melinda Gates Foundation whose resources have come to bear on this problem and have started to reverse some of these dismal statistics.

A glimpse at TB in the United States

According to the U.S. Centers for Disease Control and Prevention, a total of 10,521 new tuberculosis cases were reported in the United States in 2011, an incidence of 3.4 cases per 100,000 population, which is 6.4% lower than the rate in 2010. This is the lowest rate recorded since national reporting began in 1953.[4] In 2011, half (50.4%) of the new U.S. cases were from "entry" states — California, Florida, New York, and Texas. All four states have sophisticated public health systems; nonetheless, they

FIGURE 1.

TB DISEASE BY REGION OF THE WORLD

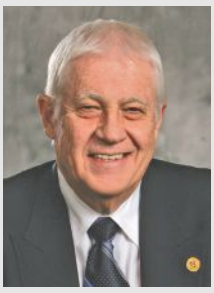
World Region	Number Thousands	Percent of Global Total	TB Mortality Per 100,000 of Population
Africa	2,529	29%	74.0
The Americas	352	4%	5.5
Eastern Mediterranean	565	6%	21.0
Europe	445	5%	7.4
South East Asia	2,993	34%	31.0
Western Pacific	1,927	22%	17.0
Global	8,811	100%	24.0

struggle with non-medical issues that make effective control impossible.

TB rates have declined since 1993 but have not reached the eradication rate of less than 1 case per 1,000,000. TB in foreign-born persons living in the United States is 12 times higher than the rate in U.S.-born individuals. Asians represent the largest ethnic group with active TB, having displaced Hispanics in 2011 for the number one position. Homeless shelters, where the guests have high alcohol-consumption habits, are noted as being sites for outbreaks of active TB cases.[5]

Presenting a world view of TB

This issue of *AARC Times* welcomes reports from a few of the AARC international fellows who are in touch with their countries' status in the ongoing battle to control this problem that now affects us all. ■



About the Author
Richard L. Sheldon, MD, FAARC, is a member of the AARC Board of Medical Advisors. He practices in Redlands, CA.

REFERENCES
1. World Health Sciences website. Tuberculosis (TB). Available at: www.worldhealthsciences.com/tuberculosis-tb.html#ixzz1yiiPoK84 *Accessed Oct. 4, 2012*
2. International Union Against Tuberculosis and Lung Disease website. Available at: www.theunion.org *Accessed Oct. 4, 2012*
3. Zignol M, van Gemert W, Falzon D, et al. Surveillance of anti-tuberculosis drug resistance in the world: an updated analysis, 2007–2010. Bull World Health Organ 2012; 90(2):111D-119D.
4. Centers for Disease Control and Prevention website. Reported tuberculosis in the United States, 2010. Available at: www.cdc.gov/features/dsTB2010Data/index.html *Accessed Oct. 15, 2012*
5. Centers for Disease Control and Prevention MMWR website. Trends in tuberculosis — United States, 2011. Available at: www.cdc.gov/mmwr/ pdf/wk/mm6111.pdf *Accessed Oct. 15, 2012*

by Malak Shaheen, MD, FCCP

Tuberculosis (TB) has a long history in Egypt. It was first documented as early as 5,000 years ago. Typical skeletal abnormalities, including Pott's deformities, were found in Egyptian mummies and were also depicted in early Egyptian drawings and art.

Tuberculosis is still a public health problem in Egypt today, but it is under control thanks to a detailed plan of action for effective TB control established by the National Tuberculosis Control Program (NTP), an entity formed by the Egyptian Ministry of Health in 1979.

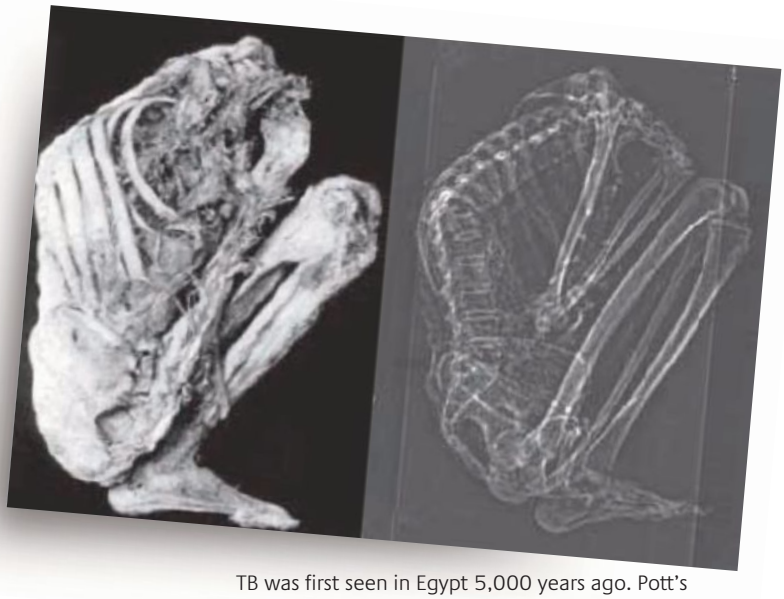
Meeting targets

According to the most recent report from the NTP, it is estimated that 18,000 tuberculosis cases existed in the country in 2011, with a prevalence rate of 24/100,000 population. The estimated incidence rate was 19/ and 8/100,000 population for all forms and smear positive tuberculosis, respectively. A total of 10,037 TB cases were reported to the NTP, of which 5,201 were sputum smear positive.

Egypt achieved global targets by detecting 78% of smear positive TB cases in 2009 and successfully treating 87% of the smear positive TB cases detected in 2008.

The NTP is collaborating with our National AIDS Program to address the magnitude and management of TB/HIV co-infection. The training of chest physicians and social workers in voluntary counseling and testing was carried out in 42 TB chest units in 2008, and rapid tests

Tuberculosis in Egypt: **Under Control**



TB was first seen in Egypt 5,000 years ago. Pott's deformities were found in Egyptian mummies.

were distributed to these units for HIV testing in TB patients after pre-test counseling of the patient. Among 10,037 TB cases tested in 2011, 15 were HIV positive.

Successful treatment

Tuberculosis is diagnosed through a TB laboratory network that includes central, intermediate, and peripheral reference laboratory services. Beginning in 2006, the World Health Organization's Global Drug Facility supported the procurement of drugs through a grant for anti-TB medicines for adults and children. This agreement included 100% buffer stock for adult formulations and 20% for pediatric formulations. The overall treatment success rate in 2009 stood at 88% for new smear-positive cases, 95% for new smear-negative/extrapulmonary cases, and 78% for retreatment.

Multidrug-resistant TB (MDR-TB) management in Egypt started by addressing a backlog of 400 chronic TB cases. In 2004, a Green Light Committee proposal was approved for the NTP, and 75 patients were enrolled in July 2006 as a pilot project for MDR-TB management. An additional 86 patients were then enrolled. A total of 260 MDR patients have been enrolled to date in two hospitals, Abbassiah Chest Hospital in Cairo and Maamoura Chest Hospital in Alexandria.

The clinician's role in managing TB includes case suspicion and detection, supervision of therapy (DOTS), continuous training to improve patient care, advocacy for patients and treatments, communication at different levels of health care (national and international), and social mobilization/support.

In 2011, Egypt had a total budget of $14 million to spend on TB control, of which 77% was funded. Eighty-five percent of available funding came from domestic sources, and 13% came from the Global Fund. ■

About the Author
Malak Shaheen, MD, FCCP, is a physician in Cairo, Egypt. She was an AARC international fellow in 2011.

ADDITIONAL READING
1. World Health Organization. TB annual global report. Egypt statistics (2011).
2. National Egyptian NTP report (2011).
3. Shaheen M, Madkour A. Immunological efficacy of Bacille Calmette-Guérin vaccination in Egyptian children: case series. Asian Pac J Trop Med 2008; 1(3):36-41.
4. Raslan O, Hafez SF, Hashem M, et al. Microscopic observation drug susceptibility assay in the diagnosis of multidrug-resistant tuberculosis. Int J Tuberc Lung Dis 2012; 16(7):941-946.
5. World Health Organization. MDR and XDR global report (2011).

Saudi Arabia Aims To Be a Model for **TB Elimination**

by Adil Al-Otaibi MSrc, RRT

Mycobacterium tuberculosis (TB) is a common disease and poses a major health problem in most of the world. Saudi Arabia is not an exception. As most cases of TB are due to reactivation of latent infection, identification of individuals with latent tuberculosis infection (LTBI) is a key element of TB control programs.

General screening of individuals for LTBI is not cost-effective, so targeted testing of individuals at high risk of disease progression is the right approach. Treatment of patients with LTBI can diminish the risk of progression to active TB in the majority of treated patients.[1]

The tuberculin skin test is considered standard practice for the diagnosis of latent TB. Blood tests to identify whether TB is active or latent, and mucus specimens along with x-ray or CT scan, are also useful.[1]

Prevalence of TB in Saudi Arabia

As per the latest WHO report, the total number of reported TB cases in 2010 was 4,549 in a population of approximately 27 million. TB in Saudi Arabia affects mainly young and middle-aged individuals; most of them between 15–44 years old. The incidence was estimated at 17 per 100,000, and only 14 MDR-TB cases were noted. The mortality rate was 1.4 per 100,000.

According to a World Bank report, the TB treatment success rate was 65% in 2009 and 61% in 2008. The TB treatment success rate is the percentage of new, registered, smear-positive cases that were cured or in which a full course of treatment was completed.[1,2]

Treatment of LTBI is intended to prevent the development of active TB disease. In most cases, a single antituberculosis agent is sufficient. Isoniazid alone is the preferred regimen for LTBI.[1] Active TB treatment involves taking multiple drugs for 6–10 months. The most common drugs used to fight TB are isoniazid, rifampin, pyrazinamide, ethambutol, and streptomycin. For persons who are likely to be infected with MDR-TB and are at high risk of developing TB, treatment should include at least two active agents.

Public health approach

Eight years ago, Saudi Arabia initiated a National Tuberculosis Control Program (NTCP) according to guidelines of the WHO expert committee on TB. The objectives of the program are to reduce the incidence of TB and eliminate it as a health problem, reduce human suffering (morbidity and mortality), and assess the extent and efficiency of existing health facilities for TB control.

The public health approach for TB prevention and control in Saudi Arabia has two parts:

- Identify and treat persons with TB disease to cure their illness and prevent further transmission.
- Identify and treat persons with TB infection (tuberculin-positive) to prevent development of the disease.

The NTCP is a country-wide program adapted to the needs of the population and is integrated into the activities of primary health care centers. It is executed through early case detection along with adequate chemotherapy with follow-up and defaulter retrieving, chemoprophylaxis for high-risk groups, BCG immunization for children, and health education with community participation. The NTCP is also offering a series of introductory training courses for health care professionals.

The Ministry of Health has realized that most TB cases come from expatriates from neighboring high-preva-

lence countries. These individuals carry a multi-resistant tubercule, so all new arrivals in the Kingdom must pass a TB screening test to receive a valid residency permit. Saudi Arabia is also conducting drug resistance surveys to measure the burden of drug resistance.

On May 13, a joint national and WHO review of the TB control program in Saudi Arabia was carried out to assess progress in TB control over the past decade by each component of the Stop TB Strategy and help the nation meet the TB elimination goal for member countries of the Gulf Cooperation Council (<1 case per 100,000 native population). The review concluded that TB is a national health priority and that Saudi Arabia has made significant progress in implementing the Stop TB Strategy.[3]

A leadership role

Saudi Arabia is already assuming a leadership role by initiating a national TB elimination campaign.[2] The Saudi minister of health is in full support of preparing a strategic document, with the technical support and collaboration of WHO, which could potentially serve to promote TB elimination in other countries, too. This whole process represents a truly historical milestone for reducing the burden and suffering from TB, not only in the region but the entire world. ■

REFERENCES
1. Al Jahdali HH, Baharoon S, Abba AA, et al. Saudi guidelines for testing and treatment of latent tuberculosis infection. Ann Saudi Med 2010; 30(1):38-49
2. World Health Organization (WHO) website. Tuberculosis (TB): TB data. Available at: http://www.who.int/tb/country/en/index.html *Accessed Nov. 2, 2012*
3. World Health Organization website. Stop tuberculosis: Saudi Arabia to become a model for TB elimination. Available at: www.emro.who.int/tuberculosis/infocus/world-tuberculosis-day-2011-campaign-on-the-move-against-tuberculosis.html *Accessed Oct. 15, 2012*

About the Author
Adil Al-Otaibi, RRT, is from King Fahad National Guard Hospital in Riyadh, Saudi Arabia. He was an international fellow in 2010.

Read a recent report from WHO on how Cambodia turned a TB health crisis into an opportunity: www.who.int/features/2012/tb_cambodia/en/index.html

TB in Peru: The **Peruvian Paradox**

by Guillermo C. Contreras Nogales, MD

Over the past 20 years, the South American country of Peru has passed from the pain and tragedy of terrorism to a continuous process of change and sustained growth.

Extreme poverty has declined from 58% to 28% in the last 12 years, and the country's growth rate of 8–10% annually is surpassed only by China.

But the Peruvian miracle is still far from perfect. One area where we could improve is in the control of tuberculosis (TB). The TB rate in Peru exceeds that of all other Latin American countries except Haiti, with a rate of 129 per 100,000 people. This is also higher than the rate seen in Eastern European countries and even sub-Saharan African countries such as Uganda, Ethiopia, and Mozambique.

MDR- and XDR-tuberculosis

Even worse is the growth in the rate of multidrug-resistant MDR-TB (resistant to isoniazid and rifampicin as first-line drugs) and exceptionally drug-resistant XDR-TB (resistant to quinolones and aminoglycoside injectable second-line). We had 3,972 reported cases of XDR-TB in 2006, comparable only to Eastern European countries like Ukraine, and unfortunately, we see no signs that this rate is decreasing. Affecting mainly those between the ages of 16–59, or the economically active population, MDR-TB is damaging the country's productive apparatus, costing up to $61 million per year, per person affected and irreparably damaging patients and their families in terms of functioning, time for rehabilitation, and loss of life.

We need about $2 billion to meet WHO targets and reduce our prevalence to within 55 cases per 100,000 in a period not exceeding five years. But we also need the nation to commit to making the battle against TB a health priority. The effort to concentrate TB control across sectors in Peru is regulated by the Ministry of Health through an office called the National Health Strategy for Prevention and Control of Tuberculosis. Cases of treatment-resistant TB and the WHO DOTS strategy are regulated by the MDR-TB management unit, which is in charge of research topics and pharmaco-vigilance.

Special challenges

Managing TB patients is difficult in patients with a high social burden. The impossibility of navigating a rugged geography in many cases overrides the need to have patients continue their therapy, and coupled with the lack of trained staff or a permanent presence to be in charge of follow-up, led Peru to create the Evaluation Committee of the National Retreat with regional representation to review special cases of MDR- and XDR-TB.

This organization is not perfect, but the formation of a more homogeneous effort is mandatory to build an institution dedicated to the control, treatment, and research of TB. Currently, Peruvian health professionals have made substantial improvements in refining and establishing universal diagnostic tests, generating substantial improvements in the laboratories responsible for diagnosing and monitoring cases of TB in all its forms.

Of course, we must deal with health professionals who may be exposed to TB as well. The afflicted deserve all the benefits of someone exposed to an occupational disease, and biosecurity measures and isolation of some health facilities have led to a true quantum leap in quality and equipment. However, we are still a far cry from what is needed to cut this vicious cycle of poverty and lack of social sensitivity to tuberculosis.

Setting the tone for victory

It is imperative to focus on TB control to ensure that the economic and social miracle in Peru continues. Peru can be an example to the nations of the world, not only because it has overcome so many problems in the recent past, but also by setting the tone for how humanity beat TB. ■

About the Author
Guillermo C. Contreras Nogales, MD, is a physician in Lima, Peru. He was an international fellow in 2010.

Tuberculosis in Paraguay: A **Work in Progress**

by Adriana Dávalos Goiriz, MD

Tuberculosis (TB) is an important, priority public health problem in my country. Despite efforts made in recent years, Paraguay has failed to control the disease.

According to the information system of the National Program for Tuberculosis Control (NPTC), the total number of new cases registered in 2009 was 2,260, which makes for an incidence rate of 35.8 per 100,000 inhabitants.

The study "Mycobacterial Resistance Surveillance in Paraguay" was the first to examine the prevalence of multidrug-resistant (MDR) TB in our country and was carried out in 2002–2003 by the Central Public Health Laboratory and the National Laboratory Network for Tuberculosis, both dependents of the Ministry of Public Health and Social Welfare. The findings were striking, with a primary resistance of 2.1%, placing Paraguay third in South America in percentage of primary MDR-TB.

A new treatment strategy

In 2006 a ministerial decision on the treatment of MDR-TB was shaped by a team called the Specialized Technical Unit in MDR-TB. This decision outlined a new treatment strategy that was tested in a pilot program. From August 2007 to November 2011 the NPTC recruited 25 patients with MDR-TB and initiated drug treatment with second-line antibacillaries. This activity required the use of human and financial resources, such as the search for MDR-TB patients and their transfer during the initial phase of treatment to the National Institute of Respiratory Diseases and the Environment (INERAM), a TB-referral hospital.

During the second stage, the treatment was performed on an outpatient basis so that the patient received second-line drugs as monitored by the responsible program in a community with previous training of health personnel in the management of DOTS PLUS.

The follow-up of the patients was made on a monthly basis in the INERAM. The NPTC was also responsible for the investigation of MDR-TB contacts, which involved regional program managers and a local search for contacts. As a strategy for treatment adherence, NPTC also provided food support to patients in treatment. This strategy is now being used to treat more patients with MDR-TB in our country.

Second study on prevalence shows mixed results

We have recently received the results of a second study, "Monitoring Tuberculosis Drug Resistance in Paraguay 2007–2008," in which primary MDR-TB reports are 0.3% lower than those observed in the previous study. However, secondary MDR-TB increased from 4–14.7%. Also, for the first time in the country, resistance was evaluated in patients with persistent smear at the end of the second month of treatment, recorded in 8.7% of MDR-TB cases. ■

About the Author
Adriana Dávalos Goiriz, MD, is a physician in Lambare, Paraguay. She was a 2009 international fellow.

ADDITIONAL READING

National Strategic Plan for Tuberculosis Control of Multidrug-Resistant TB (MDR-TB) 2012-2015. Ministry of Public Health and Social Welfare, Directorate General of Health Surveillance National Tuberculosis Control.

TB in **Lithuania**

by Valdone Miseviciene, MD, PhD

Lithuania is a country located next to the Baltic Sea in Northern Europe. It covers an area of 65,200 km^2 and had an estimated population of 3.2 million in 2011. Since 2004, Lithuania has been a member of the European Union (EU) and is also a member of NATO.

The health care system in Lithuania is designed according to the basic principles common to European cultures. Universal access to free state-funded medical services is granted to the whole population. There are enough qualified physicians, hospitals, modern diagnostic techniques, and medicines. But in spite of this, tuberculosis is still a problem in the country.

Last place finish

In 1998 the overall incidence of TB was more than 80 cases per 100,000 population. Since the implementation of the National TB Programme and various other measures, the incidence of TB has declined. In 2011 it was 53.9 cases per 100,000. Nevertheless, Lithuania ranks last or almost last in the majority of TB epidemic indicators in EU countries and is one of 27 high multidrug-resistant TB (MDR-TB) burden countries in the world.

Moreover, while the overall prevalence and incidence of TB in children has not changed significantly over the past 10 years, the incidence of MDR-TB in the child population was the worst ever registered in 2011. One-third of children are infected by family members, but others often cannot indicate the possible source of infection.

TB diagnosis is mostly made in hospitals when people are already sick. Sometimes the disease is suspected in outpatient departments by family doctors, but then the patients are referred to pulmonologists who are responsible for investigations, final TB diagnosis, treatment, and prophylaxis. The work is organized according to the national TB guidelines, which are based on international recommendations and have been adapted to the local situation and laws. Separate guidelines are used for children and adults.

If TB is suspected, there is no problem with diagnosis verification. All possible TB diagnostic tools are available in the country, and the case detection rate is even higher than universally required: 76 (66–89)% in 2010.

Waiting for help

Due to various circumstances, a big problem in Lithuania is the default of treatment. The goal of curing more than 85% of newly detected smear-positive TB cases is never achieved. Treatment success in these cases is about 82%, but in previously treated cases it is only 29.7% (2009). This is the main reason for the increase in the incidence of multidrug and extensively drug-resistant TB in the country.

The data for the child population is more optimistic. Most children are successfully treated. If required, they spend the whole treatment course in the hospital. No

(continued on page 40)

About the Author
Valdone Miseviciene, MD, PhD, is a physician in Kaunas, Lithuania. She was an international fellow in 2007.

The TB Scenario in India: Is It a **Ticking Time Bomb**?

by Devasahayam Christopher, MD

Tuberculosis (TB) is a major public health problem in India. India accounts for one-fifth of global TB incidences. Each year nearly 2 million people in India develop TB, of which around 870,000 are infectious cases. It is estimated that annually around 330,000 Indians die due to TB.[1]

India has also been identified as a hot spot for multidrug-resistant (MDR) TB infection.[2,3] Together India, China, and Russia account for more than 62% of the global MDR-TB burden.[4] According to reports from the World Health Organization (WHO) on global TB control, MDR-TB in India continues to be reported in between 2.5–2.8% and 14–17% of new and retreated TB patients, respectively.[5-9]

Key studies from a private tertiary care facility have reported even higher rates of MDR-TB in new and retreated cases.[10] A recent study undertaken for the first time in outpatients in Mumbai under the revised national TB control program (RNTCP) reveals a high proportion of MDR-TB strains in both previously untreated and treatment-failure cases, 24% and 41%, respectively.[11]

Breakthrough on the horizon

Sputum microscopy for acid-fast bacilli (AFB) remains the cornerstone for the diagnosis of pulmonary TB under the RNTCP. This is complemented by chest radiograph, which also may diagnose/guide further investigation for conditions that may mimic pulmonary TB.

Until recently, only a few centers were accredited to perform drug sensitivity testing. In the past few years, more centers have been set up to help clinicians combat MDR-TB and extensively drug-resistant (XDR) TB through early detection and prompt treatment with appropriate second-line anti-TB drugs. Conventional tests are time consuming, and culture results may take up to six to eight weeks, with drug sensitivity a further six to eight weeks.

The real breakthrough is probably on the horizon, with the advent of Xpert MTB/RIF, which helps to diagnose pulmonary TB as well as MDR status with a high sensitivity and specificity — surpassing sputum smear microscopy for AFB. The national TB control program is preparing to launch this test in a big way throughout the country at all district hospitals. This step is likely to make a tangible contribution to the control of TB in India, where the disease is now rampant. Programmatic management of drug-resistant TB (PMDT) is the RNTCP's new venture to tackle MDR-TB. I believe this is a step in the right direction and hope these efforts will make a dent in the

About the Author
Devasahayam Christopher, MD, is a physician in Vellore, India. He was an international fellow in 2005.

problem of tuberculosis, which is threatening to go out of control. Indeed, our group was among the earliest to report that XDR-TB was more common than suspected. In our cohort of retreated cases, 58.2% were MDR-TB, and among these, 60% met the criteria for XDR-TB.[12]

The crowded health care settings of India promote the spread of TB among patients as well as pose a risk to health care workers and trainees. Our group also screened a cohort of nursing students at the Christian Medical College in Vellore for TB infection using tuberculin skin test and QuantiFERON® TB Gold.[13,14] The prevalence of TB infection was 52%,[13] and the annual rate of new infection was around 8%, which is fivefold higher than the national average for the country.[14] We also reported the first case of a health worker succumbing to XDR-TB in India.[15] ■

REFERENCES

1. World Health Organization/India website. Communicable diseases and disease surveillance. Tuberculosis. Available at: www.whoindia.org/en/section3/section123.htm *Accessed Sept. 4, 2012*
2. Blower SM, Chou T. Modeling the emergence of the 'hot-zones': tuberculosis and the amplification dynamics of drug resistance. Nat Med 2004; 10(10):1111-1116.
3. World Health Organization/Geneva. Global tuberculosis control: surveillance, planning and financing. WHO/HTM/TB/2005.349: 2003.
4. Zignol M, Hosseini MS, Wright A, et al. Global incidence of multidrug-resistant tuberculosis. J Infect Dis 2006; 194(4):479-485.
5. World Health Organization/Geneva. Global tuberculosis control: surveillance, planning and financing. WHO/HTM/TB/2005.349: 2005.
6. World Health Organization/Geneva. Global tuberculosis control: surveillance, planning and financing. WHO/HTM/TB/2006.362: 2006.
7. World Health Organization/Geneva. Global tuberculosis control: surveillance, planning and financing. WHO/HTM/TB/2007.376: 2007.
8. World Health Organization/Geneva. Global tuberculosis control: surveillance, planning and financing. WHO/HTM/TB/2008.393: 2008.
9. Santha T, Gopi PG, Rajeswari R, et al. Is it worth treating Category I failure patients with Category I regimen? Ind J Tuberc 2005; 52:203-206.
10. Rodrigues C, Shenai S, Sadani M, et al. Multidrug-resistant tuberculosis in Mumbai: it's only getting worse. Int J Tuberc Lung Dis 2006; 10(12):1421-1422.
11. D'Souza DTB, Mistry NF, Vira TS, et al. High levels of multidrug resistant tuberculosis in new and treatment-failure patients from the Revised National Tuberculosis Control Programme in an urban metropolis (Mumbai) in Western India. BMC Public Health 2009; 9:211.
12. James P, Gupta R, Christopher DJ, et al. MDR- and XDR-TB among suspected drug-resistant TB patients in a tertiary care hospital in India. Clin Respir J 2011; 5(1):19-25.
13. Christopher DJ, Daley P, Armstrong L, et al. Tuberculosis infection among young nursing trainees in South India. PLoS One 2010; 5(4):e10408.
14. Christopher DJ, James P, Daley P, et al. High annual risk of tuberculosis infection among nursing students in South India: a cohort study. PLoS One 2011; 6(10):e26199.
15. James P, Christopher DJ, Balamugesh T, Gupta R. Death of a health care worker with nosocomial extensively drug-resistant tuberculosis in India. Int J Tuberc Lung Dis 2009; 13(6):795-796.

TB in Lithuania

(continued from page 38)

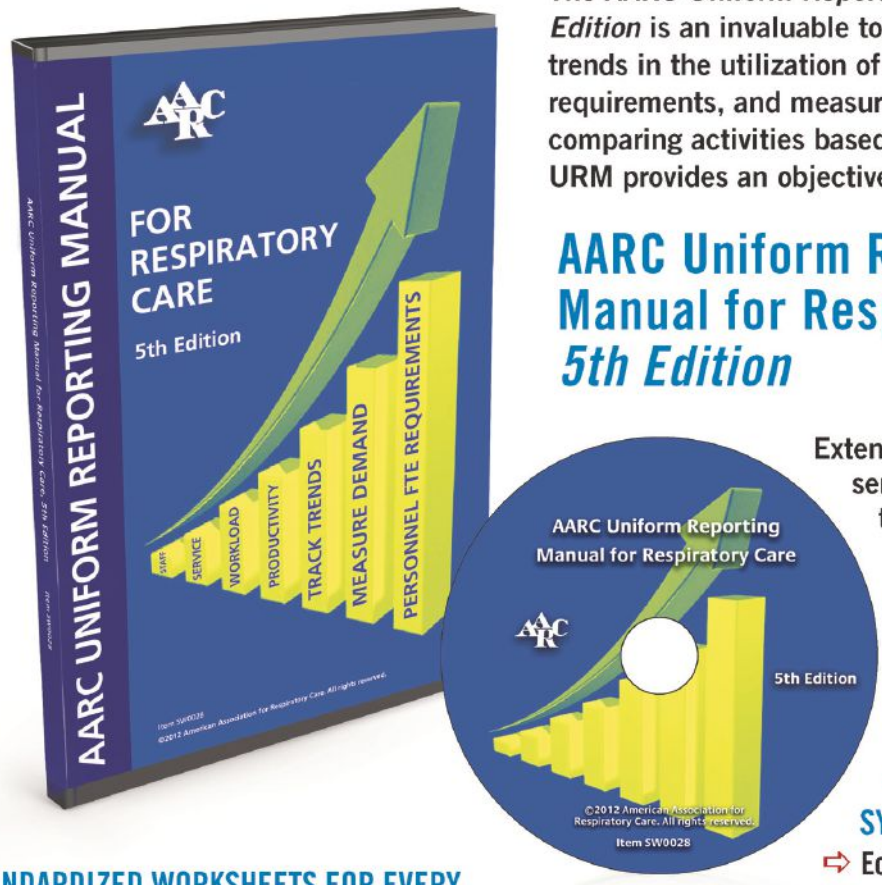
mortality from TB has been registered in children during the past three years, while in adults the death rate is about 9% among new cases and almost 30% among previously treated or MDR-TB cases.

In order to improve the epidemiological situation in Lithuania, various activities are now being developed in collaboration with the WHO and other social organizations. Clinicians are waiting for help from external sources, because only a small part of a clinician's work influences the success of treatment. From a pediatrician's point of view, close control and compulsory treatment of adult TB should be introduced much more courageously if other measures are not working. ■

REFERENCES

1. World Health Organization. WHO report 2010: Global tuberculosis control. WHO/HTM/TB/2010.7; p. 139-145.
2. World Health Organization (Europe) website. Country work: Lithuania: major challenges. Available at: www.euro.who.int/en/what-we-do/health-topics/communicable-diseases/tuberculosis/country-work/lithuania *Accessed Oct. 4, 2012*
3. Kestutis Miskinis. Tuberculosis: goals and challenges in the New Lithuanian Health Programme. Research papers by Mykolas Riomeris University: Health Policy and Management 2011; 1(3):88-102.

Your Best Tool for Evaluating Staff Productivity and Making Budget Decisions



The *AARC Uniform Reporting Manual for Respiratory Care, 5th Edition* is an invaluable tool to determine productivity, track trends in the utilization of services, establish personnel FTE requirements, and measure demand and intensity of service. By comparing activities based on relative workload intensity, the URM provides an objective means of assessing staffing adequacy.

AARC Uniform Reporting Manual for Respiratory Care, *5th Edition*

NEW!

Extending well beyond the scope of inpatient services provided in acute care hospitals, the new URM includes current data to address clinical activities for a variety of services that are frequently directed by respiratory therapists.

UPDATED PRODUCTIVITY SYSTEMS FOR:

- Hospital Inpatient Procedures

PLUS NEW PRODUCTIVITY SYSTEMS FOR:

- Echo/Non-invasive Cardiology Labs
- Blood Gas Labs
- Pulmonary Diagnostic Labs
- Sleep Disorders Labs
- Hyperbaric Medicine Labs
- Pulmonary Rehabilitation Services

STANDARDIZED WORKSHEETS FOR EVERY PRODUCTIVITY SYSTEM

Detailed Microsoft® Excel® worksheets are provided on the CD as basic templates for collecting your own activity data and validating time standards from that data. These worksheets can be copied and customized to meet your specific needs.

ALSO INCLUDED IN THE MANUAL ARE:

- Suggested time standards for clinical activities performed on adult, pediatric and neonatal patients
- Educational resources to help you understand, explain, measure and report productivity
- A step-by step approach to gathering, analyzing and reporting productivity data

Uniform Reporting Manual for Respiratory Care, *5th Edition*

Item # SW0028

Member Savings $50

Nonmember Price $225.00

AARC MEMBER PRICE $175.00

Visit www.AARC.org/store.cfm for more information or to order online.

Building a Respiratory Care Profession in the Czech Republic

AARC member travels to Prague to share knowledge

by Debbie Bunch

Thanks to connections he made through the AARC International Fellowship Program, Keith Lamb had the opportunity to witness the birth of the profession in the Czech Republic last summer.

Lamb's audience was pleased to have the chance to discuss ventilation and other topics with an American RT.

For the first 40 years or so of its existence, the respiratory care profession didn't venture far outside of its North American boundaries. Respiratory therapists here in the United States occasionally networked with their colleagues in Canada, but interaction with respiratory care professionals in other countries was minimal at best.

All that changed in 1990 when the AARC teamed up with the American Respiratory Care Foundation to create the International Fellowship Program, a unique initiative aimed at bringing inter-

national experts in the profession to the United States to visit respiratory facilities in two cities before attending the AARC International Respiratory Convention & Exhibition. The connections created by this program, which is now overseen by the AARC alone, have reached far and wide, extending well past the official bounds of the Association to encompass new relationships between facilities here and abroad — and even between individual respiratory care specialists in our country and others.

That's been the case for AARC member Keith Lamb, RRT, an RT II at Christiana Care Health System in Newark, DE. When Karel Roubik, MSEE, PhD, visited his hospital as an international fellow in the fall of last year, it was the beginning of a professional relationship that culminated this past summer in Lamb's trip to Prague to share his expertise with respiratory therapy students and other health professionals working in respiratory care in the Czech Republic.

Keith Lamb addressed advanced ventilatory techniques and their effects on hemodynamics during his session for the Czech professionals.

Activity-packed trip

"I met Dr. Roubik during his visit to my center, Christiana Care Health System, as part of his AARC/ARCF International Fellowship program in fall 2011," says Lamb. "After some discussion about his respiratory therapy program, I enthusiastically agreed to travel to Prague and lecture to students from the Na Homolce Hospital."

The one-week trip was packed with activity. In addition to delivering a lecture and leading a discussion on advanced ventilatory techniques and their effects on hemodynamics before a group that included not only students in the country's first RT program, but also a team of researchers from the Czech Technical University's biomedical engineering department and the faculty of medicine at Charles University, he had the opportunity to learn more about research being conducted in the country and efforts to develop a profession of respiratory care.

"I was able to work on an HFOV experiment in pigs in the animal lab of the 1st Faculty of Medicine at Charles University and attend a seminar with PhD students concerning current and potential research efforts regarding HFOV," says Lamb. He shared his knowledge of the U.S. educational system for respiratory therapists in discussions with the key educators involved in the RT program, Martin Mayer, Dr. Roubik, and Jan Pokorny.

Hatching the idea

Lamb says respiratory care in the Czech Republic is largely the responsibility of physicians who are board certified in anesthesia and critical care medicine. These physicians are currently the only health care professionals who are legally allowed to set up the ventilator and provide care to patients. "The first person to come up with the idea of starting the RT program was Martin Mayer, the head of the biomedical department at the Na Homolce Hospital."

Mayer's decision to pursue a profession of respiratory therapy for his country grew out of his own experience with RTs abroad. "He spent more than a year at King Faisal Specialist Hospital and Research Centre in Riyadh, Saudi Arabia, where he met a perfectly functioning and organized group of respiratory therapists," says Lamb.

When he returned home, Mayer noticed that physicians in his country often did not utilize modern ventilators to their full potential. "As a biomedical engineer, he faced many times when Czech medical doctors used very sophisticated and expensive ventilators in a very basic mode of operation without utilizing the advanced features of the devices," says Lamb. "The country has only a few MDs who are interested in respiratory care, have a good understanding of its potential risks, and are able to provide it according to up-to-date recommendations and knowledge."

Lamb joined his Czech colleagues in research experiments carried out in the lab.

The group discusses some of their findings.

200-hour course

Along with his colleagues, Mayer came up with a plan to train biomedical engineers to function as RTs. "As the profession of respiratory therapy does not exist in the Czech Republic yet, the only possibility to obtain accreditation from the Czech Ministry of Health was to create a postgraduate course for students who have already graduated from a university, such as biomedical engineers," says Lamb. "This is important because the biomedical engineers already have a qualification for dealing with patients and they have a defined position in the Czech health care system."

Since the program is being operated as a postgraduate course, it was not necessary to include basic subjects like physics, chemistry, electrical engineering, physiology, pathology, safety, and health care management into the curriculum, freeing up the educators to zero in on topics directly related to respiratory care. The course consists of 200 hours, divided into 100 hours of theoretical study and 100 hours of practical training. "The content of the studies is very similar to the courses in the United States, as it was created using materials from the AARC and several U.S. colleges and universities that provide RT education," explains Lamb. The first class enrolled seven students, who recently graduated and are now practicing on a 24/7 basis via a pilot program at Na Homolce Hospital.

Lamb says managers at the hospital are on board with the concept of formally trained RTs. "They believe in the efficiency, usefulness, and importance of bringing the RT profession to the Czech Republic, and they are in full cooperation with the educators to assure all necessary activities concerning the education and the legislation of this new profession are in order."

Bright future

Traveling to the Czech Republic to lecture to — and learn from — health care professionals there was a rewarding experience, says Lamb, and one he'll not soon forget. "At the end of my lecture there were many questions pertaining to the RC profession. It was the first time that most members of the audience had ever had the opportunity to meet a respiratory therapist and freely ask questions in real time," he says. "The students were very excited and enthusiastic about their new profession, and the physicians in the audience were equally enthusiastic and interested to know what to expect from their new RT colleagues."

As for the future of the profession in the Czech Republic, Lamb believes it looks bright. "If the first seven RTs perform very well and efficiently in the clinical setting, they will be accepted by other clinicians and it will prove the whole idea of introducing the RT profession in the Czech Republic."

The RT training team is confident they'll succeed with flying colors. According to Lamb, they are already preparing a new accreditation application under the Institute for Postgraduate Studies in Medicine in Prague that will allow them to accommodate more students into the respiratory therapy educational program. ■

Keith D. Lamb, RRT, is an RT II in surgical critical care at Christiana Care Health System in Newark, DE, and chair of the AARC Adult Acute Care Section.

Keith Lamb joins his fellow presenters on stage after the opening ceremonies of the Tongji University Ventilation Forum last August.

On to China!

Shortly after returning from Prague last June, Keith Lamb, RRT, found himself packing his bags again, this time for a seven-day trip to China. "I was invited to speak at the 2012 Tongji University Ventilation Forum in August," says the AARC member. The conference drew experts in mechanical ventilation from around the world who came together to share the latest evidence-based science on the care and treatment of patients requiring ventilatory support.

In addition to speaking at the conference, Lamb toured the ICU at the hospital, and he also boarded a bullet train to visit the historic city of Nanjing with several of the ICU staff. He used these opportunities to catch up on the latest progress being made by the profession in China, which first began training RTs back in the late 1990s. According to his Chinese colleagues, therapists are now working in a number of Chinese hospitals, and the country's National Council is in the process of drafting a legal job description for RTs in China.

The introduction of RTs to China, along with a guideline for the treatment and diagnosis of acute lung injury/acute respiratory distress syndrome (ALI/ARDS) that's based on lung protective ventilation and other cutting-edge strategies, appears to be having a significant impact on patients. One of Lamb's hosts at the conference, and a 1998 AARC international fellow, Xiangyu Zhang, MD, FCCP, FCCM, director of the ED and ICU at Shanghai Tenth People's Hospital and professor at Tongji University School of Medicine, and his colleagues are currently in the middle of a research study that's looking at how these factors may be affecting mortality for ALI/ARDS. A previous study showed an in-hospital mortality rate of 68.5% and 90-day mortality rate of 70.4% for people with the condition. Preliminary findings from the new study indicate a 60-day mortality rate of 33.3% for patients receiving care under the new paradigm. ■

Lamb makes a point during one of the sessions.

Addressing his Chinese colleagues

This bullet train took the AARC member to the historic city of Nanjing.

A Vision of Respiratory Care in Milot, Haiti

by **Natalie Napolitano, MPH, RRT-NPS, FAARC, and Daniel D. Rowley, MS, RRT-NPS, FAARC**

When most people talk about Haiti, they speak of the devastating earthquake that occurred in Port-au-Prince in 2010. They discuss how the area is rebuilding and what resources are still needed. What is often not the topic of conversation is the small town of Milot, Haiti, that did not feel the direct effects of the earthquake but had one of the only hospitals in Haiti still standing and received numerous casualties from the devastated areas.

Medical teams from all over the United States flocked to Hôpital Sacré Coeur (HSC) to receive and care for hundreds of patients flown to the medical campus by the U.S. Navy and Coast Guard. Over the following week after the earthquake, this 72-bed hospital with three operating rooms received and treated more than 400 patients and performed over 180 surgeries.

As with the volunteers who traveled to HSC, so did donations of inhaled medications and equipment. Philips Respironics donated ventilators and BiPAP® machines, along with interfaces and circuits to the hospital. These machines were useful in the aftermath of the earthquake and have been very useful to the U.S. teams since. The Haitian staff, however, has been unable to utilize these machines because they do not have intensive/critical care training. Therefore, if the U.S. teams were to place a patient on the ventilator while they were there they had to take them off before they left, even if the patient was not ready to be liberated from mechanical ventilation.

In the aftermath of the earthquake, HSC's administrators, medical director, and health care staff have been committed to improving their ability to overcome myriad health care challenges so that they may provide safe, efficient, and uninterrupted health care to those

within their community and beyond. Medical Director of HSC, Dr. Harold Previl, emphasizes that a vital part of the vision for long-term improvement of medical services must necessarily focus on adequate education for the Haitian health care work force while expanding into specialty education for respiratory and critical care. A vision for developing formal nursing, nurse practitioner, nurse anesthetist, and respiratory therapy education programs in Milot is the vision and long-term commitment of the HSC administrative staff.

The CRUDEM Foundation, the primary funding organization for HSC, contacted the AARC for assistance in advancing education and development of respiratory care in Milot. On Dec. 10, 2011, we arrived in Milot to perform a formal needs assessment for the feasibility of this long-term vision for developing a formalized respiratory therapy training program in Haiti.

During this remarkable trip, we had the pleasure of working with some very knowledgeable Haitian nurses and physicians wanting to learn everything that our profession has to teach to assist them in providing quality respiratory care to their patients. We observed the current practices, met with the medical director and nursing educator, spent time with the biomedical engineers, and performed two two-day impromptu training classes on the basics of respiratory assessments. These classes included an introduction to simple clinical interventions, an introduction to full face mask noninvasive positive pressure ventilation lab case scenario training, and clinical skills application while working clinically with the Haitian staff in the adult and pediatric ICUs and wards.

As a result of our assessment, we are assisting HSC to make their vision become a reality by administering a 10-month respiratory care training program for selected Haitian physician and nursing staff members. We have put together teams of two highly experienced RRTs, one adult and one neonatal/pediatric focused, that are providing didactic and clinical education. Since May 2012, these two-person teams have been traveling to Milot for one week each month for 10 months to deliver a didactic, laboratory, and clinical education progressive curriculum on respiratory and critical care.

We have also been assisting HSC with structuring their delivery of respiratory care and enhancing their arsenal of respiratory therapy modalities to treat both their in- and out-patients. Toward the end of the program, we will also have special sessions concentrating on community health and neonatal care while partnering with key volunteer physicians in these areas from the United States.

Also, we're happy to report that one of the persons at HSC will be one of the AARC international fellows this year — Job Joseph, MD.

In the words of Dr. Harold Previl, "To have respiratory therapists in Haiti would not just provide innovation in health care, it will save lives." ■

AUTHOR'S NOTE

If you are interested in learning more about CRUDEM and HSC, please visit its website: www.crudem.org. For more information on this respiratory care training program contact: Natalie Napolitano: napolitanon@email.chop.edu or Daniel Rowley: ddr8a@hscmail.mcc.virginia.edu.

ABOUT THE AUTHORS

Natalie Napolitano, MPH, RRT-NPS, FAARC, is a respiratory research clinical specialist at The Children's Hospital of Philadelphia in Philadelphia, PA.

Daniel D. Rowley, MS, RRT-NPS, FAARC, is a respiratory therapy supervisor at the University of Virginia Medical Center in Charlottesville, VA.

Breathing Hope into Belize

by Katie Sabato, MS, RRT-NPS

Special Baby Care Unit Belize City 2006 — now with VIP GOLDs and a >58% survival rate for neonates requiring ventilation support

It is the year 1999 — Belize City, Belize. A 2 kg preemie is born, a breathing tube is placed, and the infant is hand-ventilated by nurses for 48 hours, after which it is hoped adequate breathing will be restored. There is no blood gas monitoring, no surfactant, limited sedation, and the only infant ventilator in the country has not worked in years. The oxygen and electrical power are unreliable.

Dr. Egbert Grinage oversees the special baby care unit at the Karl Heusner Memorial Hospital in Belize City. It is time to ask for support, and he knows which health care profession will be most resourceful. He calls Children's Hospital & Research Center Oakland (CHRCO) where two years ago he completed his fellowship. He inquires if a respiratory therapist is interested in assisting him to introduce mechanical ventilation to his country. I volunteered. A peer and good friend, Lillian Fifer, RRT-NPS, would make the two-week trip as well. The Belizean Rotary International group funded the trip.

I had been the pediatric intensive care unit (PICU) clinical coordinator at CHRCO for the past 12 years and developed many relationships with sales and product representatives. In the months prior to departure, I simply asked the reps if they ever made donations or had excess infant pediatric equipment. Tri-anim was closing a local warehouse and offered me anything I could haul away. Donations were all stored in my home garage. Weeks preceding departure was spent picking up, sorting, labeling, and packaging.

On Halloween eve, one of those classic yellow school buses arrived at my door in Danville, CA. My 16-year-old, dressed as Britney Spears, greeted them (to this day I have no idea what went through their minds). Together we loaded the estimated $80,000 worth of donated equipment, and they headed back to Belize at 35 miles an hour.

Lillian and I arrived in Belize City one day ahead of the yellow bus. It had taken them one month to travel back to Belize from Danville. Our first week there was spent crawling on roofs to check out the bulk oxygen tank system with the maintenance men to assess and restore the piped-in oxygen. We restored an old Infant Star and powered up an air compressor that we had sent down.

We provided hours and hours of airway management and ventilator classes. The nursing and physician group soaked up every bit of skills they could. The Belizean newspaper reported it best, so I quote: *"At 3:00 p.m. on Sunday, Baby Y, an infant of 27 weeks gestation, decided to enter the world. Five hours later, Baby Y made history by becoming the first baby to be hooked up to a lung respirator… such is expected to save countless numbers of premature babies in the future."*

The infant did well, and a young couple interested in adopting the child flew in from Texas to inquire about it. In the year 2005 we presented at the AARC Open Forum a report on "the impact of introduction of mechanical ventilation on neonatal survival in Belize." It won us an international award that year.

In the years that followed, I returned every other year, bringing more donated ventilators, cartons of surfactant, in-line suction catheters, ventilator circuits, and humidifiers. In the ED, we attached donated pulmoaides to the walls and set up an asthma treatment area. We introduced continuous nebulization, which ended up saving the life of a young boy in severe status asthmaticus. In 2005 I joined forces with a pediatric surgeon, a biomed engineer, and a PICU nurse and formed MEDICAL C.A.R.E, expanding our services to assist with developing basic airway support and ventilation along the west coast of Africa.

There are some things we have learned throughout the years. Never go to a country and believe that you will be received warmly just because you have some equipment and some time to assist. The

First neonate ventilated in Belize 2000 — Dr. Egbert Grinage in attendance

Neonate ready for extubation in Belize City, 2008

Asthmatic receiving continuous albuterol in the pediatric ward in Belize City

ABOUT THE AUTHOR
Katie Sabato, MS, RRT-NPS, is the director of respiratory care, pulmonary function lab, and sleep lab at Children's Hospital & Research Center in Oakland, CA.

first question you will be asked is: Are you coming back? Full trust is not developed until your third or fourth time back. Developing countries know all too well those "missionary groups" that come, take a lot of pictures, and never return.

Also, if you bring a ventilator to a developing county, bring a biomed engineer with you (every year after our first visit, a BIOMED tech is in attendance); and make sure personnel are trained over and over not only on how to use the device but also how to service it. Teach them about using surge protectors, how to limit oxygen and air use, and where to get additional parts. Never bring equipment that they cannot clean, maintain, or reuse. Our mission statement is "teach them to fish in their own backyard."

Make sure you work with their administrative money holders to assure they are on board with sustaining a ventilation program. Belize now struggles as some of the ventilators used there have aged and are no longer supported by the manufacturer. Currently, I do not have up-to-date ventilators to donate and the hospital is without money for them.

Twelve years later, after returning every other year to Karl Hausner Memorial Hospital, we were honored in a ceremony held to thank us for our years of service. You can see most of the ceremony on YouTube at www.youtube.com/watch?v=gQrP1sA-IPQ.

We have just learned our next mission will be in American Samoa. I am so proud to be a Registered Respiratory Therapist and am convinced that we are the most resourceful profession when it comes to "breathing hope" into the future. None of our work would be possible without generous supporters — CareFusion, Monaghan, Westmed, Tri-anim, Philips Respironics, and RTs of the respiratory department at Children's Hospital Seattle — who climbed Mount St. Helens, raising thousands of dollars for our missionary group. ■

AUTHOR'S NOTE
If you would like to learn more about our missionary group or would like a pictorial presentation — contact Katie at ksabato@mail.cho.org.

The 59th International Respiratory Convention and Exhibition

November 16-19 (Saturday through Tuesday)
Anaheim Convention Center, Anaheim/Orange County, California

Whether you've been there before or not, you're in for a special treat. The Anaheim Convention Center will be sporting a beautiful new outdoor Grand Plaza down the promenade in front of the facility. And the location is right in the heart of the resort and amusement park area of Ahaheim/Orange County, California.

Sleep-disordered Breathing Around the World

by Camden J. McLaughlin, BS, RRT, FAARC

Sleep is essential for a person's health and well-being, yet millions of people do not get enough sleep and many suffer from the lack of sleep. Surveys conducted by the National Sleep Foundation (NSF) reveal that about 40 million Americans suffer from at least one of over 70 different sleep disorders. Sixty percent of adults report having sleep disorder symptoms that manifest at a minimum of one night per week.[1]

Most sleep disorders go undiagnosed and untreated. In addition, more than 40% of adults experience daytime sleepiness severe enough to interfere with their daily activities at least a few days each month — with 20% reporting problems with sleepiness a few days a week or more.

The NSF estimates that poor sleep costs America billions of dollars each year and greatly compromises public safety and health. Sleep disorders are on the rise, and they affect millions of Americans. Misconceptions about sleep are prevalent, and the negative effects of poor sleep on society are under-appreciated, yet they relate directly to reduced workplace performance and productivity, occupational and recreational injuries, substance abuse, and increased morbidity and mortality that is adding to the burden of rising health care expenditures and avoidable human loss.

Problems with excessive daytime somnolence affect approximately 35–40% of the U.S. adult population annually, yet its prevalence is often ignored or overlooked by individuals and society, which makes sleep disorders and the associated morbidity a serious health concern.[2]

There is considerable evidence of the cost effectiveness of treating patients with obstructive sleep apnea (OSA). This prevalence may be higher in referral populations, such as primary care and inpatient practices, where the risk for OSA in middle-age populations approximates 23–32%.[3] OSA is recognized as a common condition with major neurocognitive and cardiovascular sequelae.[4] Despite the well-documented consequences of this condition, the majority of cases remain undiagnosed, and therefore, untreated.[5] The most likely explanation for under-diagnosis and treatment of sleep disorders may be attributed to general lack of awareness by health care providers and patients, the result of a busy office practice where treatment of patients is focused on the "need for the visit," perceived personal and financial burden associated with sleep-disorder diagnostic testing, and/or the view that OSA treatment relates directly to the cumbersome use of continuous positive airway pressure (CPAP).[6]

There are disparate prevalence estimates of OSA from North America, Europe, Australia, and Asia, ranging 3–7% in adult males and 2–5% in adult females.[7] This suggests that OSA is a sleep disorder that is pandemic to global communities in developed and developing countries. Given widespread under-recognition of this disorder, the public and personal health care costs are likely to be enormous globally. It is apparent that the available estimates of sleep-disordered breathing prevalence are likely to be lower than the true burden, considering that even subtle breathing abnormalities during sleep may be of clinical significance.[8]

Jennum and Kjellberg, using data from the Danish National Patient Registry, concluded that sleep-disordered breathing has major socioeconomic consequences for the individual patient and for society. Snoring, and especially sleep apnea and obesity hypoventilation syn-

drome, were associated with significantly higher rates of health-related contact, medication use, and unemployment. It also accounted for increased socio-economic costs. Although CPAP treatment reduces mortality, earlier disease detection could have a greater impact on disease complications.[9]

The challenge to sleep health care professionals in the United States and abroad is standardizing a robust educational curriculum that includes content that may help patients recognize the acute and latent effects of untreated sleep disorders. Improving and providing readily accessible diagnostic resources and treatment options that embrace evidence-based standards of practice should be a driving force as international efforts expand within the domains of sleep education and therapeutic interventions.

It is good to see that some of our past international fellows have shared information about sleep disorders in their respective countries and, interestingly, seem to relate to many of the same issues we associate with in the United States. ■

REFERENCES

1. National Sleep Foundation website. 2002 adult sleep habits, Sleep in America poll. Available at: www.sleepfoundation.org/article/sleep-america-polls/2002-adult-sleep-habits *Accessed Oct. 24, 2012*
2. Hossain JL, Shapiro CM. The prevalence, cost implications, and management of sleep disorders: an overview. Sleep Breath 2002; 6(2):85-102.
3. Netzer NC, Hoegel JJ, Loube D, et al. Prevalence of symptoms and risk of sleep apnea in primary care. Chest 2003; 124(4):1406-1414.
4. Malhotra A, White DP. Obstructive sleep apnoea. Lancet 2002; 360(9328):237-245.
5. Young T, Peppard PE, Gottlieb DJ. Epidemiology of obstructive sleep apnea: a population health perspective. Am J Respir Crit Care Med 2002; 165(9):1217-1239.
6. Lin HS, Zuliani G, Amjad EH, et al. Treatment compliance in patients lost to follow-up after polysomnography. Otolaryngol Head Neck Surg 2007; 136(2)236-240.
7. Punjabi NM. The epidemiology of adult obstructive sleep apnea. Proc Am Thorac Soc 2008; 5(2):136-143.
8. Sleep-related breathing disorders in adults: recommendations for syndrome definition and measurement techniques in clinical research. The Report of an American Academy of Sleep Medicine Task Force. Sleep 1999; 22(5):667-689.
9. Jennum P, Kjellberg J. Health, social and economical consequences of sleep-disordered breathing: a controlled national study. Thorax 2011; 66(7):560-566.

About the Author

Camden J. McLaughlin, BS, RRT, FAARC, is president and CEO of MEDIAS Inc. Sleep Medicine Services in Blacksburg, VA, and is a past speaker of the AARC House of Delegates and currently serves on the AARC Board of Directors as a director-at-large.

The exact incidence of sleep-disordered breathing (SDB) in India today is unknown. Many prevalence studies do not break up cases into various phenotypes except with excessive daytime sleepiness (EDS), obstructive sleep apnea/hypopnea syndrome (OSAHS), and without EDS — simply called SDB.

by Arvind Bhome, MD

These studies have a biphasic design with a questionnaire survey assessing sleep and/or respiratory morbidity along with the metabolic profile. The number of people undergoing sleep studies is small, whether unsupervised at home or supervised polysomnogram (PSG) in lab. The prevalence of SDB is alarmingly higher than the world average of 3–7% in men and 2–5% in women.[1]

Body mass index, neck girth, and history of diabetes mellitus are the principal covariates of sleep-disordered breathing. Snoring, nocturnal choking, unrefreshing sleep, recurrent awakenings, daytime hyper-somnolence (EDS), and daytime fatigue are covariates for OSAHS in India.[2-5]

There is an increasing incidence of obesity, insulin resistance,[6] Type II diabetes mellitus (we have 25 million — the world's largest population),[7] and coronary artery disease among Indians, which have a two to four times higher propensity to suffer from ischemic heart disease due to narrower coronary arteries.[8] There is a real and present danger.

The global epidemic of non-communicable diseases is also affecting India. COPD is a leading cause of death,[9] and the overlap of SDB, COPD, and asthma is increasing. A recent study involving 1,000 persons from South India's four states showed that a variety of sleep-related disorders (SRDs) are more prevalent than hitherto believed.[10] The reported rates of SRDs varied 20–34.2%, depending on the instrument used. Insomnia, sleep-related breathing disorders, narcolepsy, and restless legs syndrome were reported by 18.6%, 18.4%, 1.04%, and 2.9%, respectively.

Sleep-disordered Breathing in India

India currently has no reliable set of morbidity statistics on our success rate for treating SDB. SDB is underdiagnosed and under-treated. The availability of insurance is poor.[9] The middle class has access to better diagnosis and treatment facilities, but sleep medicine is in its infancy in India.

There are about 40 sleep laboratories in India.[2] Electrocardiogram, flow-by thermistor or dP transducer, SpO_2, body position, and snoring channels are commonly used to diagnose sleep problems. Electrooculogram and multichannel electroencephalogram are rarely used. Pulmonologists and ENTs mainly use respiratory screening channels. Neurologists may use full PSGs. Individual physician practices are the main drivers of growth. All brands of continuous positive airway pressure (CPAP), auto-CPAP, and bi-level PAP machines are available in the cities. Prescription norms are unstandardized, and insurance and reimbursement are variable.

Clinicians need to be aware and up to date when diagnosing and treating SDB. Facilities are evolving. The unregulated market with knowledge gaps breeds malpractices, such as incomplete work-up and premature prescription of CPAP/bi-level PAP.

Inadequate doctor training results in inadequate patient preparation and education with poor compliance that complicates treatment. Also, competition to survive and excel in a highly fragmented health care model is high. The Indian sleep physician is a clinician, mentor, activist, leader, and change agent — a tough job indeed! ■

REFERENCES

1. Punjabi NM. The epidemiology of adult obstructive sleep apnea. Proc Am Thorac Soc 2008; 5(2):136-143.
2. Udwadia ZF, Doshi AV, Lonkar SG, Singh CI. Prevalence of sleep-disordered breathing and sleep apnea in middle-aged urban Indian men. Am J Respir Crit Care Med 2004; 169(2):168-173.
3. Sharma SK, Kumpawat S, Banga A, Goel A. Prevalence and risk factors of obstructive sleep apnea syndrome in a population of Delhi, India. Chest 2006; 130(1):149-156.
4. Vijayan VK, Patial K. Prevalence of obstructive sleep apnoea syndrome in Delhi, India. Chest 2006; 130:92S.
5. Reddy EV, Kadhiravan T, Mishra HK, et al. Prevalence and risk factors of obstructive sleep apnea among middle-aged urban Indians: a community-based study. Sleep Med 2009; 10(8):913-918.
6. Dhurandhar NV, Kulkarni PR. Prevalence of obesity in Bombay. Int J Obes Relat Metab Disord 1992;16(5):367-375.
7. Iyer SR. Type 2 diabetes express highway, where is the 'U' turn? J Assoc Physicians India 2003; 51:495-500.
8. Enas EA. Coronary artery disease epidemic in Indians: a cause for alarm and call for action. J Indian Med Assoc 2000; 98(11):697-702.
9. Bhome AB. COPD in India: iceberg or volcano? J Thorac Dis 2012; 4(3):298-309.
10. Panda S, Taly AB, Sinha S, et al. Sleep-related disorders among a healthy population in South India. Neurol India 2012; 60(1):68-74.

About the Author
Arvind B. Bhome, MD, is a pulmonologist, intensivist, professor, and sleep medicine specialist in Pune, India. He was an international fellow in 2002.

Table 1. India Prevalence Studies 2004–2009

Author/Year	Questionnaire No.	Home PSGs No.	Lab PSGs No.	SDB All	SDB M:F	OSAHS All	OSAHS M:F
Udwadia 2004 (H)[2]	658	250	—-	—-	19.5:0	—-	7.5:0
Sharma 2006 (C)[3]	2150	—-	150	13.7	19.7:7.4	3.6	4.9:2.1
Vijayan Patial 2006 (C)[4]	7975	—-	47	3.5	4.4:2.5	1.7	2.4:1.0
Reddy 2009 (C)[5]	2505	—-	365	9.3	13.5:5.6	2.8	4:1.5

LEGEND: C = community study, H = hospital study

Sleep-disordered Breathing in Italy

by Andrea Lanza, PT

The first large-scale epidemiological study on sleep-disordered breathing (SDB) was done by an Italian researcher, Dr. Lugaresi, in 1980.[1] This pioneering study gave rise to several Italian scientific contributions published over the years.

In Italy, apart from insomnia, which affects 20–40% of the population, SDB and in particular obstructive sleep apnea syndrome (OSAS) has the highest prevalence among sleep disorders, approximately 3%.[2,3] The prevalence of the other sleep disorders is similar to other Western countries. There has been an increasing prevalence and a growing awareness of sleep apnea. This is partly attributable to obesity, which is increasingly becoming an issue in our society. Although Italy is at the bottom of the ranking in Europe in terms of obesity (10.3% vs. a European average of 24%), it has increased by 25% over the past 20 years in adults. An alarming increase has also been recorded in children (current prevalence 9–11%).[4-7]

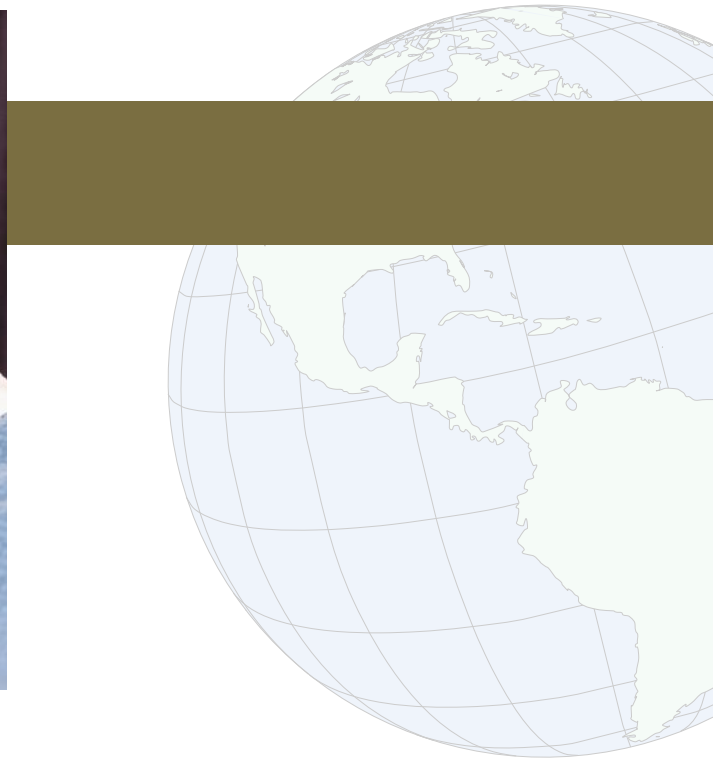
In 2006, an Italian study on OSAS emerged regarding the cost of illness.[3] Among the Italian population of 58 million, 1.6 million people are believed to have OSAS, and the most recent estimates show that the rate of patients receiving treatment is about 10%. According to these findings, the costs associated with this disorder amount to 2.5–3.8 billion Euros (3.0–4.6 billion USD), the majority attributable to the consequences of untreated OSAS.

Since the Italian health system is a public service, optimizing resources is imperative, especially considering the current economic crisis. The Italian medical associations concerned with sleep, the Italian Association of Sleep Medicine (AIMS) and the Italian Association of Pneumologists (AIPO), have been challenged to standardize and optimize the management of this disorder. The joint work of AIMS and AIPO has led to the publication of national guidelines to promote "uncomplicated" OSAS management on an out-patient basis, as described in international publications, with the aim of reducing the length of waiting lists and costs of treatment.[8-10]

Thus, in Italy, as in other European countries, we are already favoring outpatient care more than inpatient care. Recent research regarding the management of OSAS in Europe shows that portable home monitoring devices (four to six channels) appear to be extensively used for the diagnosis of OSAS (71.4%) and that automatic-CPAP titration is increasingly being used as an alternative to attended manual titration.[11] This scenario is confirmed by the preliminary results of an Italian survey in progress promoted by the Italian Association of Respiratory Physiotherapy – ARIR.[12] In addition, this survey provides interesting information on medical and non-medical staff.

The managers of Italian sleep medicine centers are generally pneumologists or neurologists, while the "non-medical" professionals who deal with sleep medicine are nurses, neuro-physiopathology technicians (TNFP), and respiratory physiotherapists (FTR). In Italy, unlike in the USA, the positions of respiratory therapist, sleep technician, and sleep technologist do not exist, and there is no certification issued by scientific associations to non-medical staff regarding sleep medicine. Historically, FTRs do not have a large role in Italian sleep labs; but during the past years, they have been increasingly involved. Currently, FTRs are involved in 24% of the centers, and they deal mainly with positive airway pressure (PAP) management while remaining uninvolved in the practice of electroencephalography because this is the responsibility of TNFPs.[10]

The Sleep Medical Center of Niguarda Hospital in Milan, where I work, is one of the first centers in Italy in which FTRs have been involved in every step of the diagnostic and therapeutic process of SDB. I believe the expertise of FTRs in the management of PAP therapy and our capability as rehabilitation professionals to pursue



the autonomy of the patient, makes our profession particularly useful in improving the patient's adherence to therapy. What's more, our clinical background concerning respiratory diseases gives us key skills to properly cooperate in the evaluation and management of every kind of sleep disorder, whether it be overlap syndrome, neuromuscular hypoventilations, or other problems.

The Italian Association of Respiratory Physiotherapy, aware of the potential value of FTR professionals in sleep medicine, is working to enhance its core competence through specialized training programs, such as postgraduate master's degree courses in physiotherapy and respiratory rehabilitation, as well as other advanced courses. ■

About the Author
Andrea Lanza, PT, is a physiotherapist specialized in respiratory therapy who holds a master's degree in physiotherapy and respiratory rehabilitation. An AARC member and frequent AARC International Respiratory Convention & Exhibition attendee, he has presented posters at the AARC Open Forum. He practices in Milan, Italy. At press time he was nominated vice-president of the Italian Association of Respiratory Physiotherapy – ARIR.

REFERENCES

1. Lugaresi E, Cirignotta F, Coccagna G, Piana C. Some epidemiological data on snoring and cardiocirculatory disturbances. Sleep 1980; 3(3-4):221–224.
2. Terzano MG, Parrino L, Cirignotta F, et al. Studio Morfeo: insomnia in primary care, a survey conducted on the Italian population. Sleep Med 2004; 5(1):67-75.
3. Croce D, et al. Il costo delle malattie: valutazione dell'impatto della sindrome da apnea ostruttiva nel sonno sull'economia italiana. Economia e Management 2006; 5:26-42.
4. European Commission, Eurostat website. Overweight and obesity – BMI statistics. European Health Interview Survey 2009. Available at: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Overweight_and_obesity_-_BMI_statistics *Accessed Oct. 21, 2012*
5. Istat.it (Instituto nazionale di statistica) website. La vita quotidiana nel 2009. ISTAT Multipurpose Survey 2009. Available at: http://www3.istat.it/dati/catalogo/20110121_00/inf_10_05_la_vita_quotidiana_nel_2009.pdf *Accessed Oct. 21, 2012*
6. Epicentro website. GRUPPO OKkio alla SALUTE 2010. Available at: www.epicentro.iss.it/focus/guadagnare_salute/pdf/OKkioalla SALUTE2010.pdf *Accessed Oct. 21, 2012*
7. Istituto Auxologico Italiano website. 7° Rapporto sull'obesità in Italia, 2011. Available at: www.auxologico.it *Accessed Oct. 21, 2012*
8. Linee guida di procedura diagnostica nella sindrome delle apnee ostruttive nel sonno dell'adulto. Commissione paritetica AIPO-AIMS. Rassegna Pat App Respir 2001; 16:261-272.
9. Insalaco G, et al. La terapia con dispositivo a pressione positiva nelle vie aeree: raccomandazioni per la prescrizione nel soggetto adulto affetto dalla sindrome con apnee ostruttive nel sonno. Documento AIPO a cura del Gruppo di Studio "Disturbi respiratori nel sonno." Rassegna di Patologia Apparato Respiratorio 2005; 20:60-63.
10. Epstein LJ, Kristo D, Strollo PJ Jr, et al. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med 2009; 5(3):263-276.
11. Fietze I, Penzel T, Alonderis A, et al. Management of obstructive sleep apnea in Europe. Sleep Med 2011; 12(2):190-197.
12. Iatomasi M, Lanza A. The management of obstructive sleep apnea: Italian nationwide telematic survey, 2012. Unpublished.

Sleep-disordered Breathing in the Philippines

Globally, obstructive sleep apnea (OSA) affects approximately 4% of the adult population, with only a fraction being diagnosed. In the Philippines, an estimated 4–6% of the population is estimated as having OSA, making this the most prevalent sleep disorder in the country, according to Dr. Michael Sarte, president of the Philippine Society of Sleep Medicine and head of Sleep Disorders Center at The Medical City. "The country's low awareness of the disease is the number one problem. This is not just the population in general, but the doctors as well — most are unaware of the disease entity. They fail to refer patients to sleep specialists," says Dr. Sarte.

by Noel S. Tiburcio, PhD, RRT-NPS

The Philippines has 25 sleep specialists in 12 recognized sleep disorders centers. Most of these centers follow the American Academy of Sleep Medicine (AASM) Standards for Accreditation of Sleep Disorders Centers, adopted by the Philippine Society of Sleep Medicine. They provide comprehensive diagnostic services and treatments for different sleep disorders, including sleep apnea, insomnia, periodic leg movements, restless legs syndrome, narcolepsy, and snoring. They are designed to conduct overnight and daytime sleep studies. Specific services include out-patient evaluation of sleep problems, diagnostic tests (polysomnography, multiple sleep latency test, maintenance of wakefulness test), and therapeutic modalities (CPAP titration). Some centers are staffed by American-registered polysomnography technologists (RPSGTs).

Sleep apnea is severely under diagnosed in the Philippines, according to Dr. Agnes Remulla, head of the sleep laboratory at Asian Hospital and Medical Center. "There's

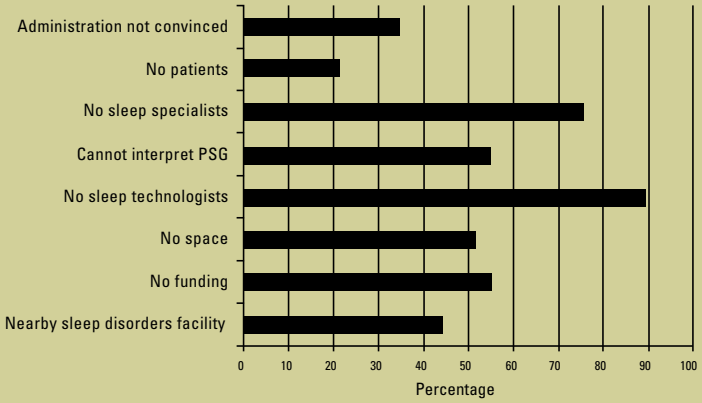
(continued on page 60)

About the Author
Noel S. Tiburcio, PhD, RRT-NPS, is the head of the respiratory therapy department at Al Ain Hospital in Al Ain, Abu Dhabi, United Arab Emirates, and ICRC Governor for the Philippines. He was an international fellow in 2009.

Sleep-disordered Breathing in Saudi Arabia

Sleep-disordered breathing is a common but underdiagnosed medical problem.[1] The magnitude of this problem is underestimated by many health care providers in the medical field due to lack of physicians' education in sleep medicine.[2] The health system in Saudi Arabia relies on the referral system, where the patient is first examined, usually by the primary health care physician who assesses and decides the patient's plan of management. Therefore, early detection and management of patients with sleep disorders depends on the significant knowledge and awareness of physicians.

Figure 1.
Reasons Cited for Lack of Sleep Facilities in Saudi Hospitals



by Mohammed AlAhmari, PhD, RRT

In Saudi Arabia, the sleep medicine specialty is relatively new; hence, sleep disorders among the Saudi population are not well investigated and studies that have addressed the size of this problem are limited. The available data indicates that the sleep disorders are prevalent among Saudis.[3] Every three of 10 Saudi men and every four of 10 Saudi women are at a high risk for obstructive sleep apnea.[4] Other reported sleep disorders include snoring in 17.9% of children, narcolepsy in 40/100,000 Saudis, and restless legs syndrome in 5.2% of Saudis.[4]

Four sleep facilities have the complete setup and staffing to perform the sleep studies. One of those facilities has certified technicians, but the other facilities have different backgrounds (respiratory therapists, nurses, and electroencephalography technicians).

The most important reasons for not having a sleep disorders facility in hospitals is that they do not have a sleep medicine service. More than one reason was possible, as noted in Figure 1.

In conclusion, the sleep medicine specialty is still underdeveloped in Saudi Arabia in comparison with other countries. More serious efforts need to be addressed at all levels to overcome these challenging obstacles addressed in the current studies for the progress of sleep medicine in Saudi Arabia. ■

REFERENCES
1. Ohayon MM, Guilleminault C, Priest RG, Caulet M. Snoring and breathing pauses during sleep: telephone interview survey of a United Kingdom population sample. BMJ 1997; 314(7084):860-863.
2. Rosen RC, Rosenkind M, Rosevear C, et al. Physician education in sleep and sleep disorders: a national survey of U.S. medical schools. Sleep 1993; 16(3):249-254.
3. Bahammam AS, Aljafen B. Sleep medicine service in Saudi Arabia. A quantitative assessment. Saudi Med J 2007; 28(6):917-921.
4. Bahammam AS. Sleep medicine in Saudi Arabia: current problems and future challenges. Ann Thorac Med 2011; 6(1):3-10.

About the Author
Mohammed AlAhmari, PhD, RRT, is the head of the respiratory care department and is assistant professor at Prince Sultan Military College of Health Sciences in Dhahran, Saudi Arabia. He was an international fellow in 2005.

Sleep-disordered Breathing in the Philippines

(continued from page 58)

a lack of interest and indifference to its importance from the physicians and patients alike," she says.

Dr. Virginia De Los Reyes, head of the sleep laboratory at Lung Center of the Philippines (LCP) explains that the country faces obstacles with regards to the management of sleep apnea:

- Some of the doctors are not fully aware of it.
- Apnea is not known to the public.
- There is a misconception that apnea is a trivial disease.
- Only the rich can have it.

One of the major challenges is the economic situation in the country; it is apparent that not all sleep apnea patients can afford to pay for the services being offered by private hospitals. The sleep laboratory at LCP, a government infirmary, aims to provide patients the expertise and resources at the most affordable cost. It costs half as much because the government subsidizes the lab.

Dr. De Los Reyes says no local studies have been conducted yet, despite the serious effects the condition might cause. "Let's try to put sleep apnea down as much as possible by conducting our own studies," she says. Through further research and development of novel technology, "sleep apnea evaluation and management can be made accessible to all," says Dr. Remulla. ■

ADDITIONAL READING
1. American Lung Association website. State of lung disease in diverse communities 2012. Available at: www.lungusa.org *Accessed Oct. 23, 2012*
2. All About Diabetes website. Breathe easy. Available at: www.allaboutdiabetes.net/breathe-easy *Accessed Aug. 15, 2012*
3. Philippine Online Chronicles website. Yapchiongco MR. Disorders of sleep and wakefulness, July 30, 2012. Available at: www.thepoc.net/thepoc-features/health-and-welness/health-and-fitness-features/9092-sleep-disorders-apnea-insomnia.html *Accessed Aug. 15, 2012*
4. All About Diabetes website. Got sleep apnea? Available at: www.allaboutdiabetes.net/got-sleep-apnea *Accessed Aug. 15, 2012*
5. All About Diabetes website. Getting back to sleep. Available at: www.allaboutdiabetes.net/getting-back-to-sleep *Accessed Aug. 15, 2012*
6. St. Luke's Medical Center, Quezon City website. Aguilera K. How do you measure a good sleep? Available at: www.stluke.com.ph *Accessed Aug. 15, 2012*
7. Philippine Daily Inquirer newspaper website. Samaniego T. Philips raises awareness on sleep disorders. Available at: http://business.inquirer.net/712/philips-raises-awareness-on-sleep-disorders *Accessed Aug. 14, 2012*
8. All about diabetes website. Sleep apnea and diabetes. Available at: www.allaboutdiabetes.net/sleep-apnea-and-diabetes Accessed *Aug. 15, 2012*
9. Philippine Star Newspaper website. Sleep tight with Resmart. Available at: www.philstar.com/Article.aspx?articleId=774977&publicationSubCategoryId=80 *Accessed Aug. 15, 2012*
10. Cebu Doctors' University website. Chua P. Snoring and sleep apnea. Available at: www.cebudoctorsuniversity.edu/colleges/medicine *Accessed Aug 15, 2012*
11. MB.com.ph (Manila Bulletin Publishing Corporation) website. Bautista-Alcaraz R. Wake up to sleep. Available at: www.mb.com.ph/articles/220554/wake-sleep *Accessed Aug. 14, 2012*

Call For Abstracts

For the 2013 Open Forum in Anaheim, CA

Submissions due by June 1, 2013

All abstracts *MUST* be submitted online at

rcjournal.com

Visit the Journal website today for all the information on the easy way to submit your ideas.

Visit rcjournal.com for more details!

RC Currents

IN THE NEWS

Pulmonary Medicine Health Policy Summit

On April 8–9, 2013, the AARC, key pulmonary-related societies, and others interested in health policy will convene for the Pulmonary Medicine Health Policy Summit in Washington, DC, to address specific issues facing the pulmonary medicine community that lend themselves to regulatory and/or legislative solutions.

At the two-day summit's conclusion, a detailed strategic roadmap will be developed and widely distributed across the pulmonary medicine community. The conference findings will also be distributed from the participating societies to inform their respective constituencies. The issues that will be addressed have been vetted by the respective societies and will involve several hours of discussion from experts, including members of Congress and their staffs, representatives of regulatory agencies, and nationally recognized experts and include:

- Performance measures for pulmonary medicine and their impact on health policy/readmission rates, pay for performance, etc.
- NHLBI funding of COPD; COPD as a public health issue
- Telemedicine for pulmonary related diseases — the technology, access, barriers
- Documentation/health electronic records
- Oxygen payment reform.

Other professional associations scheduled to participate include: the National Association for Medical Direction of Respiratory Care (NAMDRC), the American College of Chest Physicians (ACCP), the American Thoracic Society (ATS), the National Home Oxygen Patients Association, and the COPD Foundation. ■

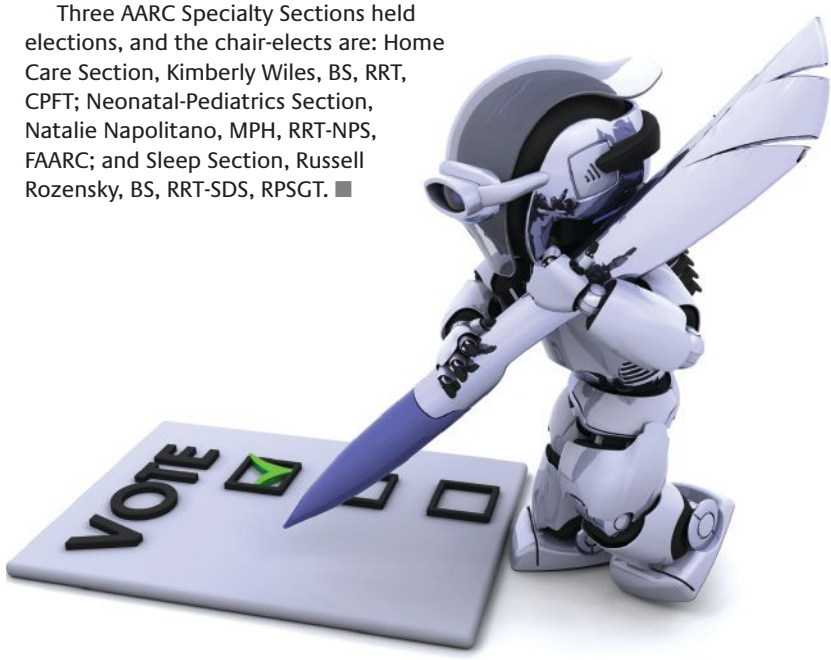
AARC Election Results Announced

AARC election results were recently announced by President Karen Stewart, MS, RRT, FAARC:

- Vice President for Internal Affairs: Brian Walsh, MBA, RRT-NPS, FAARC
- Vice President for External Affairs: Colleen Schabacker, BA, RRT, FAARC
- Secretary-Treasurer: Frank Salvatore, MBA, RRT, FAARC
- Directors-at-Large: Sheri Tooley, BSRT, RRT-NPS, FAARC; Gary Wickman, BA, RRT, FAARC

George Gaebler, MSEd, RRT, FAARC, who has served as president-elect for the past year, was installed as AARC president for a two-year term at this year's Annual Business Meeting in New Orleans. Other directors who will continue to serve out their terms are: Bill Cohagan, BA, RRT, FAARC (Management Section); Joseph Sorbello, MEd, RRT, (Education Section); Keith Lamb, RRT (Adult Acute Care); Greg Spratt, BS, RRT, CPFT (Home Care Section); Cynthia White, MSc, RRT-NPS, FAARC (Neonatal/Pediatrics Section); and at-large directors Fred Hill, MA, RRT-NPS; Denise Johnson, MA, RRT; Camden McLaughlin, BS, RRT, FAARC; Doug McIntyre, MS, RRT, FAARC; and Lynda Goodfellow, EdD, RRT, FAARC.

Three AARC Specialty Sections held elections, and the chair-elects are: Home Care Section, Kimberly Wiles, BS, RRT, CPFT; Neonatal-Pediatrics Section, Natalie Napolitano, MPH, RRT-NPS, FAARC; and Sleep Section, Russell Rozensky, BS, RRT-SDS, RPSGT. ■



Enter the 2013 AARC Photo Contest

AARC Times is looking for creative members to enter our AARC Photo Contest. Winners will receive a free one-year membership renewal and have their photo entered into our Photo-of-the-Year Contest with the chance of it being chosen to appear on the February 2014 cover. For instructions and guidelines, select the *AARC Times* icon on www.AARC.org and click on the "Photo-of-the-Year Contest" link. Deadline to submit photos is Sept. 15, 2013. ■

AARC Member Co-Authors Consensus Statement on Tracheostomy Care

AARC member Kathleen Deakins, MSHA, RRT-NPS, FAARC, co-authored a new clinical consensus statement on tracheostomy care, which was published online ahead of print by *Otolaryngology—Head and Neck Surgery* and is expected to help guide tracheostomy care for adults and children.

Deakins got involved in the project a couple of years ago after the AARC was contacted for the name of a respiratory therapist who could serve on the consensus panel. She was recommended due to her long record of active involvement in respiratory care at Rainbow Babies & Children's Hospital in Cleveland, OH, where she currently serves as clinical manager of woman's and children's respiratory care and pediatric pulmonary function and infant monitoring and has spearheaded numerous continuous quality improvement efforts over the years.

Deakins says she agreed to serve on the panel because she believed it would be a great opportunity to share the respiratory therapist's expertise in the area of trach care. "Respiratory therapists spend a great deal of time at the bedside caring for these patients and work closely with the otolaryngologists in making recommendations for improvement in selection of trach sizes and emergency management," she says. "They depend on us to help provide excellence in transitioning these patients to long-term care."

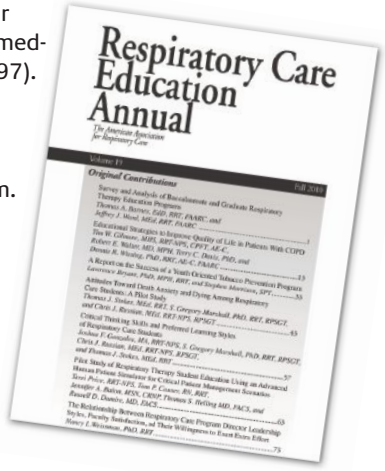
According to Deakins, the consensus team was collaborative and open, and spoke very highly of all multidisciplinary roles and their involvement in caring for trach patients. "Respiratory therapists play an integral role in the day-to-day management of tracheostomy patients and are respected for their contribution and expertise."

For more information, see www.aarc.org/headlines/12/10/trach_care.cfm. ■

Respiratory Care Education Annual Call for Papers

The AARC will publish Volume 22 of the "Respiratory Care Education Annual" in the fall of 2013. This refereed journal is committed to providing a forum for research and theory in respiratory care education and is listed in the "Cumulative Index to Nursing and Allied Health Literature."

The AARC Education Section invites educators to submit papers for consideration. Preference will be given to papers that emphasize original research, applied research, or evaluation of an educational method. Other topics that may be considered include interpretive reviews of literature, educational case studies, and point-of-view essays. Submissions will be reviewed based on originality, significance and contribution, soundness of scholarship (design, instrumentation, data analysis), generalizability to the education community, and overall quality of the paper. Papers should be approximately 6–10 pages in length and **must** follow the guidelines in the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals," 5th edition (1997). These may be found at www.rcjournal.com/guidelines_for_authors/preparing_the_manuscript.cfm. Abstracts should not exceed 250 words. For more information, contact Dennis Wissing, PhD, RRT, FAARC, editor, at dwissi@lsuhsc.edu or (318) 573-9788. Electronic copies of completed manuscripts should be sent to Bill Dubbs at edu@aarc.org. **Deadline is Feb. 28, 2013.** ■



Request for Open Forum Abstracts for AARC Congress 2013

The AARC invites you to submit abstracts for the Open Forum at AARC Congress 2013. Considered by many to be the premier event at the AARC Congress, the Open Forum is your opportunity to gain national and international recognition for your research in cardiorespiratory care by submitting an original abstract for presentation at the Congress and having it published in Respiratory Care. The deadline to submit abstracts for the Open Forum is **June 1** at http://aarc2013.abstractcentral.com/. ■

▶Transitions

Tim King, MBA, RRT, has received the 2012–2013 Keihin Endowed Faculty Chair at Edgecombe Community College in Rocky Mount, NC. The chair was endowed by a $100,000 gift received from Keihin Carolina System Technology in 2007 and rewards excellence in teaching. It is the highest honor a faculty member can receive from the college. King is director of respiratory therapy clinical education and an instructor in the respiratory therapy program. (Photo 1)

Thomas Murphy, RRT-NPS, RPFT, has been named director of respiratory therapy at the Franciscan Hospital for Children in Brighton, MA. Murphy previously directed the RT departments at Dana-Farber Cancer Institute and Spaulding Rehabilitation Hospital in Boston.

Daniel Vorse, RRT, is the new respiratory therapy manager at Family Health West in Grand Junction, CO. Vorse is a 30-year veteran of respiratory care who has worked in hospitals in Washington, Oregon, and Colorado.

Mike West, MBA, RRT, passed away in late October. He devoted his long career in respiratory care to improving education for patients, both during his years as manager of respiratory care at San Diego Children's Hospital and as the owner of Western Home Health Care in San Diego, and later as clinical marketing manager for Respiratory Drug Delivery at Philips Respironics. Philips Respironics recently endowed a new award to be given every year by the American Respiratory Care Foundation in his honor. The first Mike West, MBA, RRT, Patient Education Achievement Award was bestowed posthumously to West at AARC Congress 2012 in November. (Photo 2)

Sue Bradberry, RRT, passed away in August. She spent 18 years working as an RT at Catawba Valley Medical Center in Hickory, NC, before continuing her career caring for patients in nursing facilities in her community.

We welcome news about AARC members. Submit notices online at www.AARC.org/transitions. ■

Nominate an AARC Member for "Success Stories" or "Interesting People"

Do you know an AARC member who would be a good choice for one of our "people" features in "RC Currents"? If so, provide this information to the editor at the address below: the member's name, job title, place of work, city, and state; why you think they should be featured; and their contact information. Send to: Editor Marsha Cathcart, cathcart@aarc.org with "Success Stories" in the subject line. ■

RT Student Members: Send Us Your Stories and Editorials

AARC Times is always looking for good stories from AARC student members that relate special experiences and give the RT student perspective on the respiratory care profession they have chosen as a career. We have published the stories of several student members in *AARC Times* this year, and we continue to encourage you to share your experiences.

Have you volunteered at a summer asthma camp or helped organize the DRIVE4COPD program in your state? Have you advocated for respiratory therapy in your state capitol or on Capitol Hill? Maybe you and your RC student friends have collaborated to build a house with Habitat for Humanity. Perhaps you witnessed a lifesaving event outside the hospital setting or experienced something that took your breath away. Whatever the story, we are interested in seeing it.

If you have a story to tell, please contact *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org and include in the subject line, "Student Member Story." Be sure to give us your full name, AARC member number, a brief description of the story subject, and why you would like to have it published. Then attach a Word document of the story. We hope to hear from you soon! ■

Read the Rest of the Story at www.AARC.org

- AARC supports bill to replace DMEPOS competitive bidding — www.aarc.org/headlines/12/10/competitive_bidding/
- Wounded warriors honored at SCSRC conference — www.aarc.org/headlines/12/10/scsrc/

A New Indication Found for COPD Exacerbation Risk

An increase in the size of the pulmonary artery relative to the size of the aorta is a valid indicator that a patient with COPD is at risk for an acute exacerbation, report U.S. researchers publishing in the Sept. 3 online edition of *The New England Journal of Medicine*.

The investigators reached that conclusion after analyzing data from 3,464 patients enrolled in the COPDGene® study sponsored by the National Heart, Lung, and Blood Institute, along with 2,005 patients enrolled in the Evaluation of COPD Longitudinally to Identify Predictive Surrogate End-points, or "ECLIPSE," study. CT scans were used to determine the ratio of the size of the pulmonary artery to the aorta in current and former smokers with COPD. The risk of an exacerbation requiring hospitalization increased dramatically when the size ratio rose.

"The ability to predict which patients are likely to experience an exacerbation of their COPD symptoms requiring hospitalization is clinically significant," lead study author J. Michael Wells, MD, assistant professor in pulmonary medicine at the University of Alabama at Birmingham, was quoted as saying. "Physicians armed with this knowledge may be able to employ a more aggressive treatment to this population in an attempt to reduce their risk of hospitalization." ■

Thalidomide May Help Chronic Cough in IPF

A drug that was taken off the market in 1961 after it was linked to birth defects may help with the dry cough experienced by many people with idiopathic pulmonary fibrosis (IPF).

Johns Hopkins researchers randomized 40 patients to either low-dose thalidomide pills or a placebo for three months, followed by a two-week "wash out" period and then another three months with the opposite treatment. On average, patients reported that the frequency of their coughing decreased by about 63% while they were taking thalidomide; and their respiratory-specific quality of life, such as the ability to do daily activities, improved by about 20%. They also reported that the aspects of their life impacted by their cough improved while they were on the drug.

Researchers decided to test thalidomide in IPF patients because the drug is known to have a strong anti-inflammatory effect. The study was published in the Sept. 18 edition of the *Annals of Internal Medicine*. ■

Possible New Treatment Strategy for Mild-to-Moderate Persistent Asthma

Do patients with mild-to-moderate persistent asthma really need daily treatment with inhaled corticosteroids? No, find University of California San Francisco researchers who conducted the Best Adjustment Strategy for Asthma in the Longer Term, or "BASALT" trial.

The randomized, double-blind, placebo-controlled study involved 342 adults who were diagnosed by physicians and had either reversible airflow limitation or airway hyperresponsiveness. In each case, the participant's asthma was under control due to low-dose inhaled corticosteroids. Researchers evaluated three different approaches to the use of inhaled corticosteroids:

1. Inhaler assessments and dosage adjustments made every six weeks by a physician.
2. Inhaler adjustments made every six weeks based on measurements of exhaled nitric oxide.
3. Inhaler usage adjusted by participants based on their day-to-day symptoms. This consisted of taking one puff of their inhaled corticosteroid for every puff of an albuterol inhaler taken "as needed" for relief of symptoms.

Asthma exacerbations, symptom severity, pulmonary function, and missed days of school or work did not differ among the treatment groups. In addition, patients who took inhaled corticosteroid only when they had symptoms used half as much medication as others, indicating a significant cost savings for the treatment strategy. The study appeared in the Sept. 12 edition of JAMA. ■

▶ Strange But True…

Mini-microscopes: Physicians are increasingly using tiny microscopes that can be threaded into hard-to-reach areas of the body, such as the narrow bile ducts that connect the liver to the small intestine, to hunt for conditions like cancer. However, a new study suggests just seeing inside these structures may not be enough. Researchers publishing in *Digestive Diseases and Sciences* found only fair-to-poor agreement on the clinical significance of what they saw between physicians who viewed identical videos of these tiny places.

SPF protection on steroids: A variation on the camouflage makeup routinely used by soldiers to help them hide from their enemies has a dual purpose: the makeup also protects the soldiers from burns associated with explosives. (*Science News*)

What's old may be new again: Weill Cornell researchers who tested 5,600 existing drugs to see if they would be effective against drug-resistant tuberculosis came up with a possible winner: the pain medication oxyphenbutazone. The drug, which has been around since the 1950s and today is mainly used only in veterinary practices, attacked both the replicating and non-replicating forms of the TB bacterium in the test tube.

Turn it off! Can't sleep? It could be your nightly love affair with your iPad or other tablet device. Researchers from the Rensselaer Polytechnic Institute found people who used devices with self-luminous backlit displays for two hours before bedtime had about 22% less of the sleep-inducing hormone melatonin. ■

Improving Medication Adherence in the Chronically Ill

New research out of the RTI International-University of North Carolina at Chapel Hill Evidence-based Practice Center suggests several measures can be taken to improve medication adherence in people with chronic conditions.

The systematic review of 69 studies on interventions aimed at improving medication adherence for patients with a wide range of chronic conditions linked higher adherence to reducing co-payments or improving coverage for prescription drugs, offering case management services, and providing education to patients along with behavioral support. "The findings suggest that health care professionals can choose from among multiple effective pathways to improve patients' abilities to follow medication recommendations across numerous clinical conditions," says study author Meera Viswanathan, PhD. The *Annals of Internal Medicine* published it in its Sept. 11 edition. ■

IOM Report: U.S. Health Care Wastes $750 Billion a Year

A new report from the Institute of Medicine (IOM) finds the U.S. health care system could easily save $750 billion a year by cutting out unnecessary care and paperwork and eliminating fraud and other forms of waste. According to the IOM, the way health care operates now is akin to trying to build a home without allowing the various subcontractors to communicate with each other or running a store without posting prices.

Overall, the report identified the following six major areas of waste and the money that could be saved by addressing them:

1. Unnecessary services ($210 billion annually)
2. Inefficient delivery of care ($130 billion)
3. Excess administrative costs ($190 billion)
4. Inflated prices ($105 billion)
5. Prevention failures ($55 billion)
6. Fraud ($75 billion) ■

2013 Summer Forum

July 15 – 17, 2013 • Monday – Wednesday

Renaissance Orlando at SeaWorld® • Orlando, FL

American Association For Respiratory Care

NEW BENEFIT IN 2012

AARC CONGRESS 2012

Free Recordings to Registered Attendees of AARC Congress 2012 in New Orleans!

As a registered attendee, you will receive a special complimentary bonus this year -

Access to the Entire Library of Recorded AARC Congress 2012 Sessions

Over 250 lectures will be online and will include the audio of the speaker synched with the corresponding slides.

How does it work?

About 3 weeks after the meeting, you will automatically receive an email with instructions for accessing a special area in the AARC website. Watch the sessions that you missed or revisit lectures that made a special impact!

Distribution of these recordings is made available through an unrestricted educational grant from Dräger

Marketplace

Featuring information on products and equipment from manufacturers

SpO_2 Single Parameter Module

Covidien has launched the Nellcor™ SpO_2 single parameter module for use with the Philips IntelliVue patient monitoring platform. The Nellcor SpO_2 module incorporates Nellcor OxiMax™ pulse oximetry technology, providing a cost-effective means for clinicians to detect and treat potentially life-threatening events by creating a more complete picture of a patient's respiratory function status. The single parameter module is available in North America, the European Economic Area, and other select international markets. www.covidien.com

Humidifier Kit

Captive Technologies LLC's humidifier kit is specifically designed to interface with its StationMaster, a safety- and convenience-conscious home oxygen distribution system. The humidifier, which snaps easily into any of StationMaster's three remote stations, allows patients to move from room to room in their homes with just the humidifier and a short section of nasal cannula tubing. Because the new StationMaster humidifier travels with the home oxygen user with just a short cannula attached, the risks and headaches of tripping, crimping, tangling, and "rain out" are eliminated. www.captivetechnologies.com

▶ Press releases and photos on new products are welcome. Send to Marsha Cathcart, *AARC Times* editor, at cathcart@aarc.org.

Improve the Quality of Education and Care of Your Asthma Patients

with the ***Online***

AARC Asthma Educator Certification Preparation Course

American Association for Respiratory Care

9425 N. MacArthur Blvd.
Suite 100, Irving, TX 75063
(972) 243-2272 ◆ info@aarc.org

www.AARC.org

As a respiratory therapist, you are at the core of the team responsible for educating and caring for asthma patients.

Although you have many clinical skills in asthma care, there are additional soft skills that are required to work as an effective asthma educator. The AARC Asthma Educator Certification Preparation Course helps you learn those skills and also prepares you for the AE-C credentialing exam from the NAECB.

LEARN MORE AT AARC.ORG/EDUCATION/ASTHMA_COURSE

What the AE-C Educator Course Means to You

Expanding your understanding of asthma is a natural professional growth opportunity. Even if you don't practice as an asthma educator, it increases your knowledge so that you can *improve your education and care of asthma patients*. And, make yourself more valuable to your employer. According to a survey of AE-C holders, the certification resulted in additional job responsibilities for 20% of respondents – accounting for a 9.4% increase in salary.

SOURCE: The Certified Asthma Educator: The U.S. Experience, Pediatric Allergy, Immunology, and Pulmonology, Vol. 24, No. 3, 2011.

The Challenge of Passing the AE-C Examination

Respiratory therapists are trained in much of the content area of the AE-C examination, however portions of the examination have proven to be a challenge for RTs and other disciplines—those are the sections that are outside the RT's normal scope of practice. The AARC course helps you prepare for those sections as well as provide a refresher on scope of practice materials. Participants report a higher pass rate than the national average for respiratory therapists who took the AE-C exam. That is why more than 2,500 respiratory therapists and others have relied on the AARC course.

This continuing nursing education activity was approved by the Illinois Nurses Association, an accredited approver by the American Nurses Credential Center's Commission on Accreditation.

The Asthma Educator Certification Preparation Course has been accredited by the International Education Recognition System (IERS) and Continuing Respiratory Care Education (CRCE).

The Asthma Educator-Certified (AE-C) credential is awarded by the National Asthma Educator Certification Board (NAECB). Visit www.naecb.com/exam_information.php. The AARC Asthma Educator Certification Preparation Course is not endorsed, co-sponsored, or in any way affiliated with the NAECB.

Earn 10.5 CRCE® Credits

Nonmember Price $225.00

MEMBER PRICE $165.00

(AARC Members **SAVE** *$60.00)*

Recertification Discount: *Receive a $30 discount* if you are preparing for AE-C recertification and have previously taken the AARC online or live Asthma Educator Certification Preparation Course.

New Members

Welcome to the AARC

U.S. Members

A

Abuzer, Fayeza, Tuscaloosa, Al
Al Hadi, Nabeel, Mobile, Al
Al Qarni, Abdullah, Mobile, Al
Aldhahir, Abdulelah, Mobile, Al
Alhotye, Munyra, Mobile, Al
Almezal, Crystal, Mobile, Al
Alrougi, Mufleh, Mobile, Al
Alshehri, Hamzah, Mobile, Al
Alsolami, Nawaf, Mobile, Al
Alsolami, Sultan, Mobile, Al
Anderson, Latrese, Tuscaloosa, Al
Andrews, Edward, Mobile, Al
Ballard, Chrisdon, Birmingham, Al
Besong, Cavin, Auburn, Al
Bivins, Laquandra, Alabaster, Al
Blount, James, Alabaster, Al*
Boyle, Amy, Marion, Al
Bui, Ngoc, Mobile, Al
Cork, Scarlett, Cottondale, Al
Dodson, Lauren, McCalla, Al
Eatmon, Shannon, Northport, Al
Hood, Brittany, Boligee, Al
Howell, Angelica Nelson, Bay Minette, Al
Humphries, Brandi, Tuscaloosa, Al
Ingram, Mary Kate, Mobile, Al
James, Christopher, Tuscaloosa, Al
Johnson, Alison, Mobile, Al
Johnson, Sharina, Semmes, Al*
Le, Betty, Mobile, Al
Maitra, Deepanwita, Mobile, Al
McMikle, Denice, Tuscaloosa, Al
McNatt, Jean, Tuscumbiaal, Al*
Moore, Jasmin, Mobile, Al
Nabors, Haleigh, West Blocton, Al
Paster, Lakeisha, Tuscaloosa, Al
Richardson, Brian, Tuscaloosa, Al
Rodenbaugh, Justin, Mobile, Al
Scott, Jacob, Northport, Al
Sewell, Elizabeth, Tuscaloosa, Al
Simpson, Courtney, West Blocton, Al
Skelton, Jessica, Northport, Al
Smitherman, Alycia, West Blocton, Al
Spencer, Barry, Gordo, Al
Spencer, Laquita, Tuscaloosa, Al
Stamps, Ashley, Bon Secour, Al
Terry, Sondra, Sawyerville, Al
Wallace, Curzine, Brookwood, Al
White, Cassandra, Mobile, Al
Wilkey, Leanza, Coaling, Al
Wilson, Felicia, Greensboro, Al

Alexander, Erica, Little Rock, Ar
Allen, Joseph, Gould, Ar
Bailey, Candice, Conway, Ar
Brech, Vanessa, Cabot, Ar
Brown, Lindsey, Pine Bluff, Ar
Carlin, Lynli, Maumelle, Ar
Carr, Kristin, Little Rock, Ar
Christian, Lisa, Fayetteville, Ar*
Covington, Kaitlyn, Conway, Ar
Danner, Ann, Russellville, Ar*
Dixon, Misty, Rison, Ar*
Do, Anna, Magnolia, Ar
Dockins, Debra, Lockesburg, Ar
Dreher, Tiffany, Little Rock, Ar
Duckworth, Angela, Walnut Ridge, Ar*
Farnam, Patty, Lamar, Ar
Fortenberry, Caprice, Monticello, Ar
Foster, Logan, Pleasant Plains, Ar
Gordon, Chelsie, Taylor, Ar
Griffith, Leon, Hope, Ar
Haag, Ashley, Ward, Ar
Harper, Alicia, Little Rock, Ar
Johnson, Micheal, Little Rock, Ar
Johnson, Teresa, Pine Bluff, Ar
Jones, Amanda, Vilonia, Ar
Kelley Moss, Ebony, Jacksonville, Ar
Kizer, Jessica, Dumas, Ar
Kretz, Jeremy, Hope, Ar
Maddox, Lisa, Cherokee Village, Ar
McKane, Katheran, Mabelvale, Ar*
McKay, Sarah, Rogers, Ar
Mensch, Staci, Stuttgart, Ar
Michels, Starla, New Edinburg, Ar
Nanny, Leslie, Sherwood, Ar
Owens, Lauren, Jonesboro, Ar
Page, Ashley, Conway, Ar
Quattlebaum, Ann, Romance, Ar*
Ragsdale, Jonathan, Casa, Ar
Robertson, Brandi, Hot Springs, Ar
Samuels, Duan, North Little Rock, Ar
Schnebelen, Kyle, Conway, Ar
Scribner, April, Mayflower, Ar*
Sipes, Madison, Rison, Ar
Smith, Haley, Hope, Ar
Stephens, Donte, Gurdon, Ar
Taylor, Andrea, Vilonia, Ar
Taylor, Bridget, White Hall, Ar
Treat, Leah, Bald Knob, Ar
Vance, Maranda, Springdale, Ar
White, Brandy, Pine Bluff, Ar
Wilkes, Mary, Texarkana, Ar*
Willis, Melinda, Lewisville, Ar

Aaker, Michael, Tucson, Az
Aleman, Gildardo, Laveen, Az
Aragon, William, Tolleson, Az*
Ballard, Caroline, Scottsdale, Az
Barreras, Krysta, Peoria, Az
Bartels, Desiree, Phoenix, Az
Biba, Kreshnik, Phoenix, Az
Blakeley, Raymond, Phoenix, Az
Castro, Gilbert, Avondale, Az*
Delgado, Paola, Yuma, Az*
Evander, Serena, Phoenix, Az
Fong, Clay, Phoenix, Az
Forbes, Jodie, Phoenix, Az
Franklin, Kristine, El Mirage, Az
Gallarzo, Roberto, Glendale, Az*
Garcia, Michael, Phoenix, Az
Gorman, Erin, Phoenix, Az
Ingraham, Shannon, Mesa, Az
Jackai, Isacc, Surprise, Az
Jammer, Linetta, Scottsdale, Az
Kniep, Samantha, Chandler, Az
Kovacs, Erzsebet, Chandler, Az
Leyva, Gianina, Glendale, Az
Macias, Josefina, Phoenix, Az
Matos, Hayli, Tempe, Az
Mayer, Dennis, Kingman, Az*
Noriega, Mario, Phoenix, Az
Olson, Vicky, San Tan Valley, Az
Pepic, Ranko, Phoenix, Az
Quintero, Julio, Goodyear, Az*
Ramos, Luis, Mesa, Az
Reynolds, Katie, Mesa, Az
Sadek, Nathan, Goodyear, Az
Samaniego, Samantha, Mesa, Az
Samelson, Liam, Phoenix, Az
Torres, John, Mesa, Az
Van Den Hout, Jene, Apache Junction, Az

C

Anderson, Nicholas, Cerritos, Ca
Atthawimol, Nathan, Cerritos, Ca
Barker, Steven, Lawndale, Ca
Bazan, Sharon, Duarte, Ca
Benson, Kathy, Artesia, Ca*
Bicciche, Stephen, Whittier, Ca*
Boul, Jarrod, Auberry, Ca*
Brocato, Deirdre, Fresno, Ca*
Burgos, Leonardo, Indio, Ca*
Butler, Jonathan, Tujunga, Ca*
Carlisle, Kathryn, Petaluma, Ca*
Castillo, Natalie, Burbank, Ca
Chau, Sang, San Bernardino, Ca*
Choi, Randy, Pasadena, Ca
Cline, Shabnnon, Lomita, Ca
Clover, Maryann, Escondido, Ca
Cornelius, Arthur, Lakewood, Ca*
Cortes, Jairus, Los Angeles, Ca
Cortez, Jorge, El Cajon, Ca*
Cueson, Mario, Pasadena, Ca*
Danforth, Erin, Ripon, Ca*
Dang, Kien, Gardena, Ca
De Nijs, Jensen, Elk Grove, Ca*
Esplana, Aleeza, Sunland, Ca
Feliciano, Jhulian, Los Angeles, Ca
Ferretti, Stephen, Belmont, Ca*
Gallarza, Jacqueline, Los Angeles, Ca
Galsim, Garellee, Pleasanton, Ca
Galvez, Ricardo, Long Beach, Ca
Garcia, Ricardo, Gardena, Ca
Garcia, Rosalinda, Hawthorne, Ca
Ghitman, Elias, San Diego, Ca*
Greeson, Joseph, Canyon Country, Ca*
Hanks, Latoya, East Palo Alto, Ca*
Harris, Candice, Victorville, Ca*
Harris, Carlota, Escondido, Ca*
Heaston, John, Corona, Ca*

These individuals have been approved for membership in the AARC. Any member may object to a new membership by filing a written objection with the Executive Office within 30 days. *Active Members

Hernandez, Eli, Redlands, Ca*
Hicks, Lesa, Riverside, Ca*
Hicks, Stephanie, Simi Valley, Ca*
Hoover, Richard, Visalia, Ca*
Hoseini, Manizheh, Torrance, Ca
Johnson, Cheryl, San Ramon, Ca*
Jones, Alexis, Sacramento, Ca
Jones, Scott, Los Angeles, Ca
Labrador, Philip, Discovery Bay, Ca*
Lerman, Amy, Pleasant Hill, Ca*
Lopez, Melissa, Riverside, Ca*
Lucero, Nicole, Rowland Heights, Ca
Magann, Chloe Ann, Watsonville, Ca*
Magtanong, Louie, Carson, Ca
Manalac, Bernard-Joel, Harbor City, Ca
Marmolejo, Eddie, Bakersfield, Ca*
Mason, Stephen, Simi Valley, Ca*
Medina, Alexis, El Monte, Ca*
Michael, Chris, Torrance, Ca
Nichols, Janet, Hesperia, Ca*
Paulson, Christopher, El Monte, Ca
Pounds, Terianna, Bakersfield, Ca*
Ramriez, Omar, Los Angeles, Ca
Robinson, Kimberly, Oceanside, Ca
Ruiz, Elizabeth, Long Beach, Ca
Runyan, Jeffrey, Bakersfield, Ca*
Seamans, Ryan, La Puente, Ca
Siegel, Susan, San Francisco, Ca*
Stalnaker, Mishon, Ramona, Ca
Suarez, Angelica, Carson, Ca
Taketa, Lorinda, Dixon, Ca*
Torres, Kelly, Beverly Hills, Ca
Vartapetian, Irina, Van Nuys, Ca*
Velazquez, Carolina, Torrance, Ca
Venegas, Juanita, El Monte, Ca
Wang, Paul, Baldwin Park, Ca*
Wessels, William, Oakley, Ca*
Workman, Jon, Ladera Ranch, Ca
Wright, Ruth, Berkeley, Ca*
Yi, Lisa, Los Angeles, Ca
Young, Michelle, Blue Jay, Ca*
Zhang, Yifan, Lomita, Ca

Aubuchon, Christine, Loveland, Co
Babjak, Kim, Loveland, Co
Bacon, Jared, Fraser, Co
Bailey, Jennifer, Longmont, Co
Barker, Brittany, Arvada, Co
Barnes, Denise, Westminster, Co*
Bertin, Lisa, Louisville, Co
Brackett, Kimberly, Arvada, Co
Brunswick, Rachel, Littleton, Co
Chaparro, Anthony, Henderson, Co
Conway, Frank, Fort Collins, Co
Corbin, Richard, Grand Junction, Co*
Deguzman, Andrew, Aurora, Co
Dufour, Danielle, Denver, Co
Flageolle, Theresa, Arvada, Co*
Gichango, Kennedy, Aurora, Co*
Goertz, Ryan, Aurora, Co
Griebel, Jeffrey, Aurora, Co*
Hahn, Danielle, Windsor, Co
Hansen, Peter, Greenwood Village, Co*
Hanson, Brenda, Northglenn, Co
Henry, Jennifer, Loveland, Co
Hopper, Linda, Colorado Springs, Co*
Kintzley, Courtney, Denver, Co
Koll, Jessalyn, Littleton, Co
Lawyer, John, Longmont, Co
Lyon, Rannae, Arvada, Co*
Maley, Jean, Westminster, Co*
Mohamed, Feysel, Denver, Co
Netterfield, Sonja-Sigrid, Lakewood, Co*
O'Brien, Frank, Littleton, Co
Osterman, Melisa, Golden, Co*
Prewett, Alexandria, Denver, Co
Renshaw, Marcus, Englewood, Co
Retynski, Benjamin, Westminster, Co*
Robbins, Martin, Lafayette, Co*
Rogers, Meegan, Arvada, Co
Romero, David, Longmont, Co
Rowe, Ryan, Lakewood, Co
Sanders, Latreesha, Denver, Co
Schuck Mora, Melissa, Castle Rock, Co
Seger, Bobbi, Longmont, Co*
Simmons, Patrick, Aurora, Co
Smith, Arana, Aurora, Co
Stang, Brandi, Castle Rock, Co
Walden, Alaine, Wheat Ridge, Co*
White, Dannielle, Pueblo, Co
Wold, Jeff, Aspen, Co*

Bozickovic, Dragana, Stafford Springs, Ct
Caruso, David, Bristol, Ct
Christian, Kathryn, Windsor Locks, Ct
Cool, Dr Jeffrey, Naugatuck, Ct
Gunpat, Joan, Windsor, Ct*
Maciejczyk, Leonora, Milford, Ct*

D

Ahmed, Mozaffar, Wilmington, De*
Hughto, Ashley, Hockessin, De*
Iverson, Judith, Claymont, De*
Jacobs, Alexandra, Townsend, De*
Staples, Mark, New Castle, De*
Whitmore, Camille, Dover, De*

F

Andersen, Gary, Parkland, Fl*
Angelini, Mark, Orlando, Fl
Ardon, Keila, Orlando, Fl
Arrowood, Brittany, Gainesville, Fl
Austin, Alana, Maitland, Fl
Babione, Meagan, Hobe Sound, Fl
Becker, Timothy, Lake Monroe, Fl*
Boyd, Jennifer, Gainesville, Fl
Briggs, Margaret, Gainesville, Fl
Bryan, Chante, Apopka, Fl
Bryant, Erika, Fort White, Fl
Burgett, Simuel, High Springs, Fl
Campbell, Theresa, Delray Beach, Fl
Castejon, Gabriela, Gainesville, Fl
Castro, Yesenia, Miami Gardens, Fl*
Charles, Benson, Boynton Beach, Fl
Charles, Delanaud, Boynton Beach, Fl
Clark, Kali, Port Saint Lucie, Fl*
Clay, Lindsey, Gainesville, Fl
Coney, Lashanda, Gainesville, Fl
Corneck, Amanda, Gainesville, Fl
Costa, Camilla, Gainesville, Fl
Cruz, Juan, Miami, Fl*
Damaso, Neilzen, West Palm Beach, Fl*
Damier, Duverger, Hollywood, Fl*
Davila, Ricardo, Miami, Fl
Dean II, Harold, Orlando, Fl
Decade, Patricia, Orlando, Fl
Del Valle, William, Orlando, Fl
Drummond, Angela, Kissimmee, Fl
Fiorentino, Francesca, West Palm Beach, Fl
Fowler, Eric, Gainesville, Fl
Fowler, Justin, Gainesville, Fl
Funwi, Albert, Orlando, Fl
Gaskin, Chantae, Gainesville, Fl
Godefoy, Deyanira, Miami, Fl*
Gomez, Anthony, Lake Worth, Fl
Graziano, Chad, Gainesville, Fl
Green, Adam, Gainesville, Fl
Hamlin, Colin, Tampa, Fl
Harrington, Kelly, Orlando, Fl
Harris, James, Melbourne, Fl
Harvey, David, Gainesville, Fl
Haupt, Melissa, Oviedo, Fl
Heenan, Natalie, Casselberry, Fl
Hester, Leslie, Fort Lauderdale, Fl*
Hooks, Monica, Orlando, Fl
Huber, William, Hudson, Fl
Hukle, Jana, Gainesville, Fl
Jannat, Abu, North Palm Beach, Fl
Johnson, Jody, Palm Beach Gardens, Fl
Johnson, Octabia, Pensacola, Fl
Johnson, Richard, Lakeland, Fl
Justin, Roshni, Tampa, Fl*
Keshavarz, Melinna, Sanford, Fl
Kondas, Michael, Boynton Beach, Fl
Leblanc, Nicole, Royal Palm Beach, Fl
Lucas, Victoria, Gainesville, Fl
Mongelut, Lorraine Riley, Fort Myers, Fl*
Monteverde, Kristin, Palm Beach Gardens, Fl
Murat, James, Delray Beach, Fl
Murphey, Jamie, Gainesville, Fl
Orr, Jacklyn, Orlando, Fl*
Osburn, Rick, Archer, Fl
Percovich, Enzo, Gainesville, Fl
Pineda, Luis, Winter Springs, Fl
Planas, Jenifer, Archer, Fl
Powell, Erin, Alachua, Fl
Quach, Loq, Coconut Creek, Fl
Renaud, Sonia, Winter Springs, Fl
Rhodes, Carla, Orlando, Fl
Riley, Alissa, Apopka, Fl
Ringeisen, Todd, St Petersburg, Fl*
Roa, Araceli, South Bay, Fl
Rogge, Wendy, Jupiter, Fl
Rousseau, Robenson, West Palm Beach, Fl
Sharpe, Sofia, Altamonte Springs, Fl
Steele, Ashleigh, High Springs, Fl
Swanson, Wendi, Altamonte Springs, Fl
Syllion, David, Lake Worth, Fl
Tessy, James, Davie, Fl*
Tillis, Amy, Lake Butler, Fl*
Ton, Dan Huyen, Orlando, Fl
Tran, Angela, Pensacola, Fl
Travis, Margaret, Gainesville, Fl
Turchon, Douglas, Gainesville, Fl
Tyler, Carmen, Keystone Heights, Fl
Valdez, Natanael, Orlando, Fl
Vargas, Selomit, Belle Glade, Fl
Vidal, Vilma, Gainesville, Fl
Williams, Amber, Jacksonville, Fl*
Williams, Jeremy, West Palm Beach, Fl
Wilson, Amanda, Winter Springs, Fl

G

Alexander, Cynthia, Stockbridge, Ga*
Anderson, Delma, Augusta, Ga
Bates, Natasha, Augusta, Ga
Booker, Ebony, Thomson, Ga
Bridges, Brenda, Griffin, Ga
Burns, David, Augusta, Ga
Burns, Patricia, Decatur, Ga*
Burton, Brandi, Hampton, Ga
Caldwell, Sharon, Stone Mountain, Ga*
Cash, Peggy, Lula, Ga*
Coachman, Sharon, Augusta, Ga
Dickerson, Jason, Augusta, Ga
Engram, Joann, Valdosta, Ga*
Franklin, Chaka, Jonesboro, Ga*
Gopaul, Kurt Carlton, Fayetteville, Ga
Green, Kilee, Macon, Ga*
Hicks, Ben, Augusta, Ga
Hullander, Angela, Ft Oglethorpe, Ga*
Hurkes, Shanice, Atlanta, Ga
Jeffers, Marcia, Lawrenceville, Ga*
Johnson, Kia, Appling, Ga
Jordan, Karen, Tifton, Ga*

Keri, Wright, Evans, Ga
Krystal, Basey, Harlem, Ga
Lawal, Rashidat, Stone Mountain, Ga*
Marshall, Charlotte, Stone Mountain, Ga*
Morrison, Richard, Martinez, Ga
Niebeling, Robert, Suwanee, Ga*
Norris, Lela, Riverdale, Ga
Okothcha, Christopher, Lithonia, Ga
Walton, Shanika, Sandersville, Ga
Wood, Whitney, Augusta, Ga

H

Castanares, Lawrence, Pearl City, Hi*
Machado, Ken, Ewa Beach, Hi*
Matsunaga, Jon, Honolulu, Hi
Perry, Geraldine, Ewa Beach, Hi*
Rapanut, Ricky Jay, Waipahu, Hi
Sakamoto, Micah, Honolulu, Hi

I

Malcolm, Julia, Burlington, Ia*

Becker, Greg, Grand View, Id
Durrant, Robert, Pocatello, Id*
Grimm, Virginia, Post Falls, Id
Gyurcsik, Meg, Middleton, Id
Hill, Megan, Spirit Lake, Id
Khaliki, Vida, Boise, Id*
McCarthy, Timmi, Meridian, Id
Tracy, Barbara, Nampa, Id

Bowman-Phillips, Cheryll Ann, Bismarck, Il*
Brand, Danielle, Steeleville, Il*
Brown, Kimberly, Peoria, Il
Cullum, Malford, Grayslake, Il
Devore, Debrah, Mascoutah, Il
Dugger, Don, Cortland, Il
Emuze, Lucky, Springfield, Il*
Feng, Jianchi, Naperville, Il*
Ferguson, John, Rockford, Il*
Ginter, Jennifer, Hoffman Estates, Il
Graca, Michal, Prospect Heights, Il
Grigsby, Eva, Chicago, Il*
Hanchar, Beth, Elgin, Il*
Hettinger, Anne, Grafton, Il*
Heuring, Lia, Dupo, Il*
Icalia, Victor, Alsip, Il*
Lacke, Stephen, Libertyville, Il
Laging, Suzanne, Chicago, Il*
Livermore, Julie, Orion, Il
McAllister, Maryjo, Oak Lawn, Il*
Rakers, Gina, Trenton, Il*
Reardon, Cheryl, Quincy, Il*
Szabla, Hope, Orland Park, Il*
Wartenbe, Precious, Venice, Il
Washington, Tionya, Bellwood, Il*
Ziegler, Kimberly, Delavan, Il

Anthony, Wendy, Kokomo, In
Ayres, Cally, Cutler, In
Baltosser, David, Warsaw, In*
Borns, Joanne, Hobart, In*
Bosche, Megan, Rossville, In
Brightwell, Shane, West Lafayette, In
Bryant, Teresa, Winamac, In
Chapman Brandt, Bethany, Lafayette, In
Clarkson, Jeannine, Churubusco, In*
Cook, Dawn, Lafayette, In
Cotner, Tiffany, Goodland, In
Cox, Charles, Bloomington, In*
Cronk, Nanette, Otterbein, In
Davis, Connie, Lafayette, In
Eaton, Shonda, Indianapolis, In*
Frasure, Karen, North Judson, In*
Gray, Jessie, West Lafayette, In
Hansen, Jessica, Lafayette, In
Hedrick, Austin, West Lafayette, In
Hoffa, Thomas, Wingate, In
Johnson, Anita, Indianapolis, In*
Kirkham, Kimberly, Stockwell, In
Leonard, Amanda, Attica, In
Mailloux, Caitlin, West Lafayette, In
McIntosh, Tara, Rossville, In
McKinnie, Tereasa, Goldsmith, In
Mislivecek, Emily, Rensselaer, In
Nunez, Adriana, Lafayette, In
Oden, Tracie, Lafayette, In
Pepmeier, Caryl, Monroe City, In*
Polson, Melissa, La Porte, In*
Reeve, John, Lafayette, In
Rhine, Annette, Indianapolis, In*
Rupp, Janelle, Lafayette, In
Sandlin, Maria, Lafayette, In
Schultz, Randee, Delphi, In
Seele, Reanne, Delphi, In
Smith, Ryan, Lafayette, In
Thoma, Niki, Dayton, In
Townsend, Marissa, Lafayette, In
Trent, Casie, Bringhurst, In
Unsworth, Danielle, Thorntown, In
Vancoppenolle, Staci, West Lafayette, In
Wallace, Angela, Lafayette, In
Watson, Amanda, Greentown, In
White, Deshell, Rossville, In
Wilson, Joseph, Lafayette, In
Wilson, Stephanie, Lafayette, In
Wiseman, Shay, Avon, In*

K

Brooks, Dana, Wichita, Ks*
Engelhaupt, Mark, Leawood, Ks*
Richardson, Lisa, Lenexa, Ks
Stucky, Bryan, Wellington, Ks*

Ahmad, Shireen, Louisville, Ky*
Birdsong, Macie, Princeton, Ky
Bishop, Shannon, Campbellsville, Ky*
Cantrell, Theresa, Ashland, Ky*
Green, Awilda, Thelma, Ky*
Jones, Danny, Bedford, Ky*
Machal, Karen, Danville, Ky*
Mattingly, Michael, Louisville, Ky*
Whitfield, Jennifer, Louisville, Ky*

L

Cato, Michele, Shreveport, La
Cooper, Brittney, Shreveport, La
Corley, Cindy, Shreveport, La
Davis, Christie, Heflin, La*
Dooley, Robby, Shreveport, La
Hamilton, Monica, Bossier City, La
Jackson, Cartina, Shreveport, La
Johnson, Joshenia, Shreveport, La
Jordan, Ashley, Shreveport, La
Perkins, La'shonda, Shreveport, La
Player, Berkelia, Shreveport, La
Scarbrough, Gwendolyn, Shreveport, La*
Sellers, Tami, Luling, La*
Smith, Roslin, Shreveport, La
Stewart, Lakisha, Shreveport, La
Thornhill, Jimmy, West Monroe, La*
Thornton, Melissa, Shreveport, La
Williams, Cody, Cut Off, La
Woods, Angela, Frierson, La*
Youngblood, Kenyasha, Shreveport, La

M

Blodgett, Rebecca, Lawrence, Ma
Bompane, Heather, Lawrence, Ma
Borden, Michelle, Lawrence, Ma
Briggs, Jenna, Sterling, Ma*
Carini, Holly, Brockton, Ma
Caron, John, Wilbraham, Ma*
Chenelle, Christopher, Medford, Ma
Connolly, Diane, Weymouth, Ma*
Connolly, Robin, Quincy, Ma*
Curtis, Renee, Quincy, Ma*
Darosa, Christopher, Fall River, Ma*
Desimone, Teresa, Lawrence, Ma
Fay, Ashley, Lawrence, Ma
Flaherty, Christopher, Lawrence, Ma
Hmissi, Fatiha, Malden, Ma*
Howell, Christine, Lawrence, Ma
Jones, Christina, Lawrence, Ma
Lemire, Patricia, Southbridge, Ma*
Lillie, Brendan, Ashland, Ma*
Mahan, Dienou, Lawrence, Ma
Malatzky, Jessica, Lawrence, Ma
Martin, Grace, Lawrence, Ma
McAleer, Vicky, Webster, Ma*
McGuinness, Amy, Weymouth, Ma
McKee, Matthew, Middleboro, Ma*
Mello, Donna, Rochester, Ma*
Middleton, Andrea, Lawrence, Ma
Momplaisir, Marguerite, Lawrence, Ma
Nelson, Alicia, Newburyport, Ma
Pesaturo, Richard, Lawrence, Ma
Petti, Kathleen, East Bridgewater, Ma*
Rabkin, Leonid, Foxboro, Ma*
Rejaey, Pakor, Worcester, Ma*
Rysnik, Tyler, Lawrence, Ma
Schena, Amanda, Lawrence, Ma
Scoville, Helen, Springfield, Ma*
Stuckey, Jessica, Lawrence, Ma
Unsderfer, Jessica, Palmer, Ma*
Wright, Kyle, Lawrence, Ma

Alston, Jacqueline, Baltimore, Md*
Alston, Tiona, Nottingham, Md
Anderson, Brandi, Baltimore, Md
Belay, Adiam, Silver Spring, Md*
Benhene, Abigail, Baltimore, Md
Blake, Anthony, Baltimore, Md
Bowden, Jessica, Sharptown, Md*
Boyer, Robin, Silver Spring, Md*
Cameransi, Tracy, Elkton, Md*
Campbell, Tim, Glen Burnie, Md
Echibe, Kelechi, Essex, Md
Fultz, Bryan, Catonsville, Md
Guanzon, Robby, Joppa, Md
Heath, Eric, Baltimore, Md
Johnson, Ebony, Essex, Md
Johnson, Kimberly, Baltimore, Md
Johnson, Tara, Edgewood, Md
Koroma, Peter, Lanham, Md*
McCurdy, Rebecca, Baltimore, Md
Messi, Tatianna, Baltimore, Md
Moore, Gerard, Clinton, Md*
Morcom, John, Salisbury, Md*
Paul, Linda, Baltimore, Md
Planter, Brandy, Baltimore, Md
Pon, Marla, Hyattsville, Md
Runnels, Kelly, Saint Michaels, Md*
Siagat, Renadin, Burtonsville, Md
Sweat, George, Columbia, Md*
Watson, Diamond, Baltimore, Md
Weimer, Kim, Baltimore, Md

Kiernan, Susan, Biddeford, Me*
McKee, Susan, South Portland, Me

Bolish, Linda, Troy, Mi*
Cleveland, Nicole, New Haven, Mi*
Coltson, Brian, Midland, Mi*
Corey, Susan, Portland, Mi*
Crane, Diana, Mayville, Mi*
Emrick, Troy, Lambertville, Mi*
Galura, Catherine, Ann Arbor, Mi*
Groves, Marie, Sterling Heights, Mi*
Hannosh, Jennifer, Utica, Mi*
Hart, Gina, Metamora, Mi*
Masterton, Maryann, Grand Rapids, Mi
Roberts, Yolanda, Grand Rapids, Mi
Schwein, Jonathan, Niles, Mi
Tilly, Andrea, Clinton Township, Mi
Vander Vliet, Nicholas, Portage, Mi
Veurink, Kimberly, Grant, Mi*
Veurink, Shaun, Grant, Mi*
Xi, Jinxiang, Ada, Mi*

Abdel Fattah, Alie Eldine, Columbia Heights, Mn
Affa, Yordanos, Saint Paul, Mn
Aviles, Joy, Saint Paul, Mn
Breth, Stephanie, New Hope, Mn
Cox, Racheal, Andover, Mn
Decker, Lee, Hugo, Mn*
Dumas, Josh, Robbinsdale, Mn
Enzi, Randy, Northfield, Mn
Gishe, Hebano, Saint Paul, Mn
Grant, William, Minneapolis, Mn
Hettinger, Noreen, Rochester, Mn*
Hrobochak, David, Oakdale, Mn
Joiner, Frieda, West Saint Paul, Mn
Kamin, Katie, Golden Valley, Mn
Marks, Dale, Saint Paul, Mn*
Meyers, Gabriel, Hugo, Mn
Michels, Emily, North Branch, Mn
Mohamed, Jamal, Roseville, Mn*
Moy, Stephen, Apple Valley, Mn
Nimley, Oretha, Coon Rapids, Mn
Owusu, Victor, Rosemount, Mn
Payne, Mary, Rockford, Mn
Reilly, Matthew, Saint Paul, Mn
Schimelpfenig, Brianna, Eden Prairie, Mn*
Theisen, Jamie, Sartell, Mn*
Tomczyk, Sandra, Saint Anthony, Mn
Webb, Nathan, Saint Paul, Mn
Welter, Gary, Shoreview, Mn
Xiong, Mai, Roseville, Mn
Xiong, Tou, Saint Paul, Mn

Alford, Donald, Osage Beach, Mo
Bland, Gloria, Saint Louis, Mo
Boyet, Matt, Maryland Heights, Mo
Bradley, Ashley, Imperial, Mo
Brawley, Jessica, Festus, Mo
Bright, Summer, Webb City, Mo*
Brooks, Pam, Saint Louis, Mo
Cook, Lynn, Hillsboro, Mo
Davies, Laura, Sullivan, Mo
Dempewolf, Lauren, Saint Charles, Mo
Dillinger, Kimberly, Pomona, Mo*
Dimartino, Filomena, Saint Louis, Mo
Fizer, Ashly, Blue Springs, Mo
Flanigan, Amanda, Wentzville, Mo
Gregson, Stephen, Independence, Mo*
Gronefeld, Cheryl, Saint Peters, Mo
Hagy, Jonathon, Saint Peters, Mo
Hall, Melissa, Bourbon, Mo
Hewkin, Kayla, Cuba, Mo
Holloway, Lisa, Waynesville, Mo
Jarzynka, Grant, Clayton, Mo
Keeney, Nicole, Crystal City, Mo
Kimble, Michelle, O Fallon, Mo
Lanham, Sharon, Independence, Mo*
Lindeman, Amanda, High Ridge, Mo*
Martin, Albert, Saint Louis, Mo
Mayrand, Jody, Waynesville, Mo
McFadden, Timothy, Bourbon, Mo
McKay, Heather, Lake St Louis, Mo*
Phillips, Will, Saint Louis, Mo
Piazza, Megan, Cuba, Mo
Puff, Jamie, Washington, Mo
Roemer, Nikki, Saint Clair, Mo
Row, Carla, Fenton, Mo
Ruff, Erica, Saint Louis, Mo
Short, Trisha, Hillsboro, Mo
Stovall, Kelsey, Cuba, Mo
Struckhoff, John, Washington, Mo
Suellentrop, Sabrina, Arnold, Mo
Tritschler, Ashley, Saint Louis, Mo
Tucker, Elizabeth, Union, Mo
Weiss, Krysta, O Fallon, Mo
Withers, Amy, Independence, Mo*
Wyatt, John, Columbia, Mo*

Banks, Theresa, Clarksdale, Ms
Davis, Deadria, Columbus, Ms
Dawson, Cherena, Cleveland, Ms
Evans, Tiffany, Gautier, Ms
Gillich, Angela, Diberville, Ms
Hackman, Sharon, Hernando, Ms
Halle, Gina, Walls, Ms
Henderson, Quenetta, Greenville, Ms
Holmes, Marcie, Noxapater, Ms
Logan, Krystal, Pascagoula, Ms*
McCoy, Britney, Greenville, Ms
Montgomery, Shonnan, Glendora, Ms
Moore, Theodore, Friars Point, Ms
Raymond, Janis, Moorhead, Ms
Thomas, Arthur, Greenville, Ms
Van Pelt, Maryann, McComb, Ms*
Washington, Tashara, Olive Branch, Ms
Western, Crystal, Cleveland, Ms
Westmoreland, Barbara, Caledonia, Ms
Wilbanks, Elizabeth, Clarksdale, Ms

Archey, Joshua, Stockett, Mt
Baez, Alexandria, Great Falls, Mt
Broesder, Maggie, Great Falls, Mt
Dickey, Trinia, Great Falls, Mt
Jensen, Brian, Great Falls, Mt
Kelley, Tyler, Great Falls, Mt
Martinich, Marynda, Great Falls, Mt
Miller, Daryl, Great Falls, Mt
Parnell, Jeff, Great Falls, Mt
Saulter, Heather, Great Falls, Mt
Spinder, Cynthia, Great Falls, Mt
Sprenger, Julie, Great Falls, Mt
Vancampen, Chad, Monarch, Mt

N

Ajasa, Oluwabamiwo, Durham, NC*
Barnes, Amy, Apex, NC*
Bradshaw, Trudy, Connellys Springs, NC*
Brescia, Donald, Greenville, NC
Cheek, Brian, Winston Salem, NC
Cornett, Chris, Winston Salem, NC
Duncan, Arthur, Waynesville, NC*
Edgerton, Malcolm, Fayetteville, NC
Fox, Kristy, Vale, NC
Funderburk, Calvin, Charlotte, NC*
Gillespie, Robert, Knightdale, NC
Griffin, Karen, Durham, NC*
Helms, Casey, Stanfield, NC*
Hilton, Iris, North Wilkesboro, NC
Irving, Nora, Franklinton, NC*
Mehta, Aditi, Concord, NC*
Penland, Benjamin, Fayetteville, NC*
Powell, Elverso, Fayetteville, NC*
Rogerson, Carol, Tarboro, NC*
Thomas, Alice, Lumberton, NC*
Verity, Victoria, Winston-Salem, NC
Woodson, Brandy, Pelham, NC*
Ziemann, Jeanne, Murphy, NC

Andres, Rebecca, Bismarck, ND
Bachman Williams, Alexandra, Bismarck, ND
Braaten, Emily, Bismarck, ND
Carlson, Kayla, Bismarck, ND
Grad, Chelsey, Bismarck, ND
Guenther, Brianne, Bismarck, ND
Hilzendeger, Greg, Bismarck, ND
Joritz, Brittany, Bismarck, ND
Martinez, Breanna, Bismarck, ND
Rasor, Nathan, Bismarck, ND
Simonich, Timothy, Bismarck, ND
Stanton, Heather, Bismarck, ND
Tranby, Brian, Bottineau, ND*

Gates, Jackie, Ord, Ne*

Craffey, Arthur, Nashua, NH*
Lacroix, Pamela, Hampton, NH*
Nicolosi, Paul, Salem, NH*
York, Kristin, Plaistow, NH

Alberto, Nancy, Bergenfield, NJ*
Allen, Frank, Williamstown, NJ*
Aviles, Caryline, Randolph, NJ
Barkhamer, Bernice, Sewell, NJ*
Barrett, Mary, Howell, NJ*
Brod, Samantha, Woodbury Heights, NJ
Brown, Lindsey, Millville, NJ
Camarote, Scott, Barrington, NJ*
Caruso, Nichole, Andover, NJ
Chan, Daniel, Linden, NJ*
Collings, Leah, Sewell, NJ
Cox, Dennis, Williamstown, NJ
Dejesus, Ervin, Hackettstown, NJ
Deras, Reyna, Dover, NJ
Dougherty, Tiffany, Sicklerville, NJ
Dulichan, Susan, Whitehouse Station, NJ*
Duty, Roberta, Morristown, NJ
Feniola, Danison, Sicklerville, NJ*
Golaub, Alvis, Wayne, NJ*
Gurick, Stacy, Gibbstown, NJ
Hamfeldt, Peter, Morristown, NJ
Havrilla, Andrew, Newton, NJ
Hwang, James Soo, Woodbury, NJ
Johnson, Janet, Bridgeton, NJ
Joseph, Geemon, Highland Park, NJ
Joseph, Lukose, Lake Hiawatha, NJ
Kalafut, Patricia, Ogdensburg, NJ
Katada, Juan Paulo, Cherry Hill, NJ
Lafferty, Michael, Cape May Court House, NJ*
Laricks, Heather, Cape May Court House, NJ
Laurita, Lisa, Lodi, NJ*
Leconey, Todd, West Berlin, NJ
Lui, Carolina, Parsippany, NJ
Lum, Jill, Hainesport, NJ
Maloba, Peter, Union, NJ*
Masino, Surell, Newton, NJ
Mathis, Andre, Willingboro, NJ
Mattappillil, Joseph, River Edge, NJ*
McCallum, George, Kinnelon, NJ
Melamed, Caroline, Ventnor City, NJ
Modero, Michael, Sussex, NJ
Moore, Denita, Mount Laurel, NJ*
Morales, Celia, Newfield, NJ
Moran, Laura, Vernon, NJ
Muzzarelli, Lauren, Milmay, NJ
Njokubi, Adonis, West Orange, NJ*
Noel, Yves, Woodbridge, NJ*
O'Doherty, Sarah, Newton, NJ
Ottavio, Melissa, Franklinville, NJ
Paulinho, Christina, Morris Plains, NJ
Pearce, Dianne, Newton, NJ
Pennell, Mallory, Spring Lake, NJ*
Phruksaraj, Elizabeth, Belleville, NJ*

Piwowarski, Ronald, Clementon, NJ
Pulopulo, Katerina, Sussex, NJ
Punk, Edit, Randolph, NJ
Ransom, Christopher, Egg Harbor Twp, NJ
Reglos, Reneir, Westwood, NJ*
Rigg, Carol, Orange, NJ
Rios, Cindy, Mantua, NJ
Rios, Heather, Mantua, NJ
Rios, Michael, Mantua, NJ
Rojas, Esteban, Dover, NJ
Sawaged, Faris, Lumberton, NJ
Scaccetti, Jenna, Hamilton, NJ*
Schwendiman, Melissa, Mays Landing, NJ
Seymour, Jeff, Sussex, NJ
Shaner, Mykal, Hammonton, NJ
Shertz, Kelly, Andover, NJ
Simmons, Regina, West Deptford, NJ
Simonetti, Tia, Sewell, NJ
Solorio, Angelo, Williamstown, NJ
Sottong, Tara, Hamilton, NJ
Sternbach, David, Clifton, NJ
Thomas, Jecil, Budd Lake, NJ*
Titus, Nathalie, West Orange, NJ*
Tolentine,, Arturo, Deptford, NJ
Uhl, Donald, Sicklerville, NJ
Woods, Tenaya, Williamstown, NJ
Wright, Kim, Clementon, NJ

Cook-Julian, Andrea, Albuquerque, NM
Levin, Richard, Albuquerque, NM*

Juera, Virgilio, Las Vegas, Nv*
Livernash, Julia, Logandale, Nv*
Robertson, Mandee, Henderson, Nv*

Abalos, Donna, Staten Island, NY*
Abuhamra, Aneesa, Buffalo, NY
Acosta, Julia, Cohoes, NY
Admettre, Stella, Rockaway Park, NY*
Angrisano, Jeremiah, Buffalo, NY
Benson, Bruce, Webster, NY*
Bosovets, Grazhina, Buffalo, NY
Bristol, Leslie, Albany, NY*
Calixte, Claudine, Uniondale, NY*
Cenatus, Marjorie, Brooklyn, NY*
Cook, Michael, Cheektowaga, NY
Diaz, Joel, Buffalo, NY
Duplan Bras, Maryse, Baldwin, NY*
Eagleton, Kristen, Buffalo, NY
Elliott, Sandra, Rochester, NY*
Ganci, Maria, Tonawanda, NY
Germinal, Cassandra, Brentwood, NY
Ilyasova, Karina, Brooklyn, NY*
Jakubowicz, Courtney, Cheektowaga, NY
Khan, Niema, South Ozone Park, NY
Kim, Soo Kyoung, Stony Brook, NY
Latysheva, Oksana, North Tonawanda, NY*
Lenk, Jennifer, Buffalo, NY*
Lin, Lily, Brooklyn, NY*
Long, Michael, Buffalo, NY
Maldonado, Christina, Lackawanna, NY
Mason, Christine, New City, NY*
Maxwell, Joseph, East Amherst, NY
McHugh, Keara, Lackawanna, NY
Mikolajek, Tracey, Hamburg, NY
Mucyn, Megan, Lancaster, NY
Mugalli, Leema, Buffalo, NY
Peccia, Michael, Buffalo, NY
Perez, Frances, Staten Island, NY*
Phillippi, Amber, Hamburg, NY
Pierre, Dimcay, Brooklyn, NY
Pilliod, Adrian, Kenmore, NY
Poe, Amanda, Cheektowaga, NY
Porr, Brian, Astoria, NY
Redden, Lois, Bronx, NY
Reid, Mark, Cheektowaga, NY
Robertson, David, Cheektowaga, NY
Russell, R Jeffrey, Southold, NY*
Russell, Stephen, Buffalo, NY
Russell, Trudy, New Kingston, NY
Samuel, Richard, Olean, NY
Simmons, Dionne, Buffalo, NY
Simmons, Rockey, Lockport, NY
Sutton, Cheryl, Buffalo, NY
Thompson, Reginald, Buffalo, NY
Verner, Jamie, Albany, NY*
Whalen, Renae, Grand Island, NY
Whaley, Sharon, Waterford, NY*
Wichert, Diane, Cicero, NY*
Wilder, Cherie, Brunswick, NY*
Wilson, Charmaine, Elmont, NY*
Zajac, Tracie, Buffalo, NY

O

Belville, Kristy, Martins Ferry, Oh
Brinegar, Charles, Mansfield, Oh
Destefano, Alesia, Steubenville, Oh*
Fletcher, Joshua, Beavercreek, Oh*
Griffith, Robert, Martins Ferry, Oh
Heckathron, Serena, Steubenville, Oh
Higgins, Ashlee, Anna, Oh
Howard, Grace, Lakewood, Oh*
Keirsey, Kim, Toronto, Oh
Kessinger, Dianna, Kettering, Oh*
King, Kelly, Bloomingburg, Oh*
Klemens Dragos, Kristine, Canton, Oh*
McMurray, Natassja, Akron, Oh*
Osborn, Tammara, Tloronto, Oh
Pena, Mauricio, Cleveland, Oh
Petho, Tara, Saint Clairsville, Oh*
Petty, Shellie, Belpre, Oh*
Slisher, Elaine, Huron, Oh*
Smith, Cindy, Bellaire, Oh
Tost, Alice, Steubenville, Oh
Updegraff, Haley, Martins Ferry, Oh
Waggoner, Alanna, Toronto, Oh
Williams, Melanie, Hamilton, Oh
Wittler, Emily, Columbus, Oh*

Aston, Sabrina, Broken Arrow, Ok*
Durham, Elizabeth, Oklahoma City, Ok*
Erickson, Taina, Yukon, Ok*
Gower, Jon, Oklahoma City, Ok*

Barbian, Mary, Grants Pass, Or*
Ireland, Lesli, Portland, Or*
Lohkamp, Carmen, Gresham, Or
Spohn, Russell, Oregon City, Or*

P

Alkhuja, Samer, East Stroudsburg, Pa*
Ansah, Amma, Glenside, Pa
Austin, Nafis, Philadelphia, Pa
Barker, Marci, Warren, Pa*
Bliss, Elaine, Kane, Pa*
Cheek, Scott, West Chester, Pa
Clarke, Michelle, Philadelphia, Pa
Clauss, Nicholas, Philadelphia, Pa
Cook, Lance, Claysville, Pa*
Corcoran, Susan, Philadelphia, Pa
Cornell, Dawn, Fleetwood, Pa*
Courtney, Alyssa, Philadelphia, Pa
Crawford, Yvonne, Waterford, Pa*
Dadalski, Eric, Philadelphia, Pa
Davis, Marlie, Philadelphia, Pa
Dickens, Brandon, Philadelphia, Pa
Dwobeng, Oheneba, Philadelphia, Pa
Elias, Tracy, Pittsburgh, Pa*
Fuller, Melissa, Philadelphia, Pa*
Gba Kamara, Ahmed, Downingtown, Pa
Gordon, Joseph, Pittsburgh, Pa*
Gray, Timothy, Philadelphia, Pa
Griffiths, Tracy, Philadelphia, Pa*
Groark, Michael, Philadelphia, Pa
Groppi, Justin, Pittsburgh, Pa*
Gundry, David, Doylestown, Pa*
Iovino, Elise, Philadelphia, Pa
Jewett, Michelle, Le Raysville, Pa*
Juszczak Davis, Anna, Philadelphia, Pa
Kerschner, Tina, Jimthorpe, Pa*
Kimmel Ramey, Vicki, Carlisle, Pa*
Kubek, Leon, Philadelphia, Pa*
Kuntz, Kathryn, Pittsburgh, Pa*
McGurney, John, Philadelphia, Pa
McLaughlin, Patrick, Tidioute, Pa*
Mihailoff, Andrew G, Millersburg, Pa*
Nation, Shawnie, Philadelphia, Pa
Oliver, Kieth, Philadelphia, Pa
Passiotti, Melissa, Philadelphia, Pa
Patrick, Patson, Drexel Hill, Pa*
Peralta, Sintia, Philadelphia, Pa
Rook, Emil, Waynesboro, Pa*
Sloan, Joyce, Harrisburg, Pa*
Smith, Siah, Philadelphia, Pa
Swearingen, Colleen, Philadelphia, Pa
Sychterz, Jenna, Reading, Pa
Taylor, Jermaine, Coatesville, Pa*
Taylor, Mark, Philadelphia, Pa
Vasquez, Melvin, Philadelphia, Pa
Wetherbee, Brennan, Oil City, Pa
Williams, Robyn, Philadelphia, Pa
Wilson, Ronald, Philadelphia, Pa

R

Avedisian, Kathleen, South Kingstown, RI*
Branconnier, Matthew, North Providence, RI*
Lemme, Sara, Johnston, RI*

S

Adams, Christina, Jonesville, SC*
Burke, Tanisha, Clover, SC
Ewing, Michael, Warrenville, SC
Gibson, Nancy, Mauldin, SC
Green, Latoya, Lancaster, SC*
Watson, Latricia, Charleston, SC
Williams, Holly, Summerville, SC*

Dewald, Rich, Yankton, SD*
Mutchler, Danelle, Newell, SD*
Steele, Jean, Brookings, SD*
Thomson, Katherine, Rapid City, SD*

T

Baker, Kari, Lenior City, Tn
Barnett, Jonathan, Kingston, Tn
Benson, Ashley, Knoxville, Tn
Boesinger, Lisa, Thompson Station, Tn
Burgess, Frankie, Rockwood, Tn
Chelette, Rae, Murfreesboro, Tn
Cunningham, Rosa, Nashville, Tn
Curtis, Rachel, Chapel Hill, Tn
Deridder, McKayla, Columbia, Tn
Dye, Chantal, Chattanooga, Tn*
Etienne, Aaron, Loretto, Tn
Fournier, Robert, Collierville, Tn*
Gatton, Colleen, Nashville, Tn
Goad, Byron, Pioneer, Tn
Hackney, Courtney, Maynardville, Tn
Harris, Karita, Columbia, Tn
Himlin, Barbara, Spring Hill, Tn
Hodges, Quankeshia, Cordova, Tn

Jirkovsky, Gina, Clarksville, Tn
Kallon, Iye, Antioch, Tn
Lampley, Cole, Dickson, Tn
Lloyd, Brad, Robbins, Tn
Lynch, Magen, Centerville, Tn
Paschall, Miranda, Fairview, Tn
Perkins, Michael, Friendsville, Tn
Phipps, David, Allardt, Tn
Pointer, Jane, Knoxville, Tn
Poirier, Sean, Knoxville, Tn
Porter, Megan, Chapel Hill, Tn
Prescott, Donnie, Spring Hill, Tn
Sherrill, Kristen, Crossville, Tn
Smith, Michael, Knoxville, Tn
Smotherman, Ashley, Christiana, Tn
Taylor, Charles, Knoxville, Tn
Tovar, Sara, Powell, Tn
Vale, Stacy, Memphis, Tn
Vazquez, Connie, Rockvale, Tn
Weber, Hella, Lyles, Tn
Wells, Elizabeth, Lewisburg, Tn
Wheeler, Sheila, Atoka, Tn
Winegar, Alisha, Wartburg, Tn
Zumbrum-Furline, Alyson, Bon Aqua, Tn

Abbey, Jennifer, Converse, Tx
Abraham, Puliyodil, Lewisville, Tx*
Acevedo, Guillermo, El Paso, Tx*
Acton, Steve, Murphy, Tx*
Alhwail, Khawla, Arlington, Tx
Allen, Amanda, Tyler, Tx
Amaya, Jami, Gilmer, Tx
Ameen, Shabnam, Arlington, Tx
Arvizu, Marisol, Wichita Falls, Tx
Aucion, Michael, San Antonio, Tx
Barlow, Moneque, Bedford, Tx
Bell, Kevin, Universal City, Tx*
Betancourt, Maria, Tyler, Tx
Bew, Michael, San Antonio, Tx
Bieleu, Gaelle, Tyler, Tx
Blanton, Danelle, Quitman, Tx
Blodgett, Heather, Bedford, Tx
Bowman, Curtis, Fort Worth, Tx
Brady, John, Converse, Tx
Bricka, Matthew, Tyler, Tx
Broadbeck, Patricia, San Antonio, Tx
Brodie, Shelly, Angleton, Tx
Burkitt, Teresa, Fort Worth, Tx
Butler, Monique, Fort Worth, Tx*
Cao, Thu, San Antonio, Tx
Capuchina, Juan, Sonora, Tx
Carrasco, Jacob, Tyler, Tx
Chacon, Carla, Haltom City, Tx
Chimney, Semein, Tyler, Tx
Cinco, Ricky, Kingwood, Tx
Cintron, Sondra, Tyler, Tx
Clark, Lindsey, Texarkana, Tx
Cleaver, Lauren, San Antonio, Tx
Clock, Lisa, Murphy, Tx*
Cogswell, Brandy, Pearland, Tx
Cooks, Chris, Tyler, Tx*
Cooper, Laquesha, Winona, Tx
Cordero, Natalia, Abilene, Tx
Couey, Brandy, Brownsboro, Tx
Daise, Maxzine, San Antonio, Tx*
Day, Heather, Tyler, Tx
De Jong, Barbara, White Settlement, Tx*
Deadmon, Belinda, Longview, Tx
Deason, Marita Lenesso, Allen, Tx
Dixon, Marla, Nederland, Tx*
Doss, Rae, Fort Worth, Tx
Earnhart, Kirk, White Oak, Tx
Essing, William, San Antonio, Tx
Falduto Posada, Daisy, Brownsville, Tx
Feinauer, Michael, Mansfield, Tx
Fletcher, Jenny, Danbury, Tx*
Flores, Christopher, Conroe, Tx*
Forrester, Orion, San Antonio, Tx
Gandhi, Brijal, Pearland, Tx
Garcia, Amador, Mission, Tx*
Garcia, Cassandra, Harlingen, Tx
Garcia, Everal, League City, Tx*
Garcia, Frank, Abilene, Tx
Garner, Forrest, Tyler, Tx
Gilbreath, Tiffany, Quitman, Tx
Giorno, Brandi, Houston, Tx*
Gonzalez, Vanessa, Haltom City, Tx
Granberry, Kelcie, Tyler, Tx
Green, Darrell, Ben Wheeler, Tx
Gurung, Amrita, Irving, Tx
Guzman, Erika, Forest Hill, Tx
Hannaman, Megan, Miles, Tx
Harrison, Kimberly, San Antonio, Tx
Hasic, Samra, Rowlett, Tx*
Heath, Stephen, Danbury, Tx
Henderson, Rrt, Roberta, Plano, Tx*
Hernandez, Maricela, San Angelo, Tx
Hickman, Jean, Golden, Tx
Hilleren, Erica, Colleyville, Tx
Hinojosa, Daniel, Jacksonville, Tx
Hughey, Mallory, Burleson, Tx
Huton, Misty, Abilene, Tx
Iley, Kimberly, Abilene, Tx
Ilouno, Nkeiruka, San Antonio, Tx
Jendrzey, Elizabeth, Yoakum, Tx*
Jithin, James, Stafford, Tx
Jones, Nancy, Woodway, Tx
Kay, Christopher, San Antonio, Tx
Kelley, Midori, Fort Worth, Tx
Kemp, Kendallyn, Euless, Tx
Kendall, Kati Jo, Abilene, Tx
Kirk, Loca, Tyler, Tx
Klein, Carmen, Arlington, Tx
Kocer, Nazia, Arlington, Tx
Kohutek, Madison, San Angelo, Tx
Komasa, Heather, Pearland, Tx
Kuruvilla, Christee, Missouri City, Tx
Lancaster, Krista, Tyler, Tx
Lawrence, Laura, Houston, Tx*
Leggett, Sandra, Merkel, Tx
Leitch, Adam, Copperas Cove, Tx
Lewis, Clayton, Mount Pleasant, Tx
Lockhart, Candice, Ennis, Tx*
Lowe, Amy, Allen, Tx*
Lumang, Noemelch, Brownsville, Tx*
Maglio, Stephanie, San Antonio, Tx
Mahan, Melissa, Fort Worth, Tx*
Mahle, Matia, Tyler, Tx
Martinez, Wilfredo, Converse, Tx

Mason, William, San Antonio, Tx
Mault, Matthew, San Antonio, Tx
McCall, Kevin, Bedford, Tx
McGee, Lasaundra, Tyler, Tx
Meyer, Michael, San Antonio, Tx
Milton, Anna, Houston, Tx
Mohammad, Hasan, Alvin, Tx
Morris, Morgan, Longview, Tx
Muhammad, Chaka, San Antonio, Tx
Myers, Kimberly, Abilene, Tx
Nasir, Samia, Fort Worth, Tx
Neill, Carolyn, Henderson, Tx
Newsome, Rickey, San Antonio, Tx
Ngemera, Arnold, Sugar Land, Tx*
Ngetich, Samson, Dallas, Tx
Noah, Ashley, Pearland, Tx
Nolan, Geoffrey Matt, Fort Worth, Tx*
Odhiambo, Evelyne, Tyler, Tx
Oquin, Aaron, San Angelo, Tx
Paddack, Haley, Fort Worth, Tx
Parker, Bethany, Chandler, Tx
Perkins, Teresa, Longview, Tx
Phillips, Misty, Graham, Tx*
Pierce, Joseph, Waco, Tx
Pierce, William, Tyler, Tx
Poulson, Eric, San Antonio, Tx
Poulter, Brandie, Kilgore, Tx
Preston, Jeremy, Terrell, Tx
Pullman, Heather, San Antonio, Tx
Rambaud, Cheryl, Richmond, Tx*
Redfern, Harley, Tyler, Tx
Rich, Brandi, Cuero, Tx
Rivera, Adalberto, San Antonio, Tx
Roberson, Michael, San Antonio, Tx
Rodden, Buck, Texarkana, Tx
Romero, Morgan, Rotan, Tx
Saman, Amy, Angleton, Tx
Sanchez, Hannah, San Angelo, Tx
Santamaria, Elisa, Abilene, Tx
Sconce, Shannon, Stamford, Tx
Shelton, D'andia, Fresno, Tx
Spencer, Patricia, Tyler, Tx
Stark, Naomi, Abilene, Tx
Strange, Katy, Kilgore, Tx
Swink, Amy, Gilmer, Tx
Tapia, Monique, San Angelo, Tx
Taylor, Elizabeth, Pittsburg, Tx
Thompson, Bobbidee, Lawn, Tx
Todd, Brooke, Hawkins, Tx
Touray, Nfansu, Tyler, Tx
Tristan, Esther, Austin, Tx*
Tuttle, Paul, Livingston, Tx*
Vela, Diana, McAllen, Tx*
Vigil, Alexis, Arlington, Tx
Villarreal, David, Houston, Tx*
Vue, Nancy, Irving, Tx
Walker, Sheadrena, Tyler, Tx
Watkins, Dawn, Arlington, Tx
Watson, Michelle, Whitehouse, Tx
White, Melinda, San Angelo, Tx
Whitehead, Cary, Fort Worth, Tx
Wilson, Lana, Haltom City, Tx*
Wylie, Heather, Alvin, Tx
Zett, Michelle, San Angelo, Tx

U

Sagers, Steve, Salt Lake City, Ut*

V

Coble, Wayne, Floyd, Va*
Deel, Tresa, Roanoke, Va*
Farmer, Chenita, Charlottesville, Va*
Gebretensai, Mekdes, Alexandria, Va
Holmes, Carolyn, Arlington, Va
Holsey, Derrick, Virginia Beach, Va
Howard, Shana, Alexandria, Va
Jones, Alicia, Glen Allen, Va*
Jongjaisu, Kanyanat, Alexandria, Va
Koduah, Diana, Centreville, Va*
Morris, Pamela, Danville, Va*
Rahman, Anm, Centreville, Va
Saleh, Anjilla, Alexandria, Va
Tako, Anthonia, Alexandria, Va*
Wright, Laporsha, Manassas, Va

Mead, Ashley, Cambridge, Vt*

W

Abraham, Cindy, Pacific, Wa*
Arulampalam, Sivakumar, Lacey, Wa
Bell, Richard, Spokane Valley, Wa
Brown, Mark, Vancouver, Wa*
Budlong, Emily, Spokane, Wa
Burgess, Clark, Spokane, Wa*
Charles, Patricia, Bainbridge Island, Wa*
Christensen, Steven, Spokane Valley, Wa
Fruehwirth, H Michael, Springdale, Wa
Gary, Huntamer, Olympia, Wa*
Haney, Rebecca, Spokane Valley, Wa
Howell, Nicholas, Spokane, Wa
Johnston, Neil, Spokane Valley, Wa
Kincaid, Brandi, Mead, Wa
Kuropatkina, Yelena, Spokane, Wa
Leick, Jennifer, Spokane, Wa
Mariano, Percival, Renton, Wa
Marks, Kai, Spokane Valley, Wa
McFields, Maria, Seattle, Wa
Nerren, Joshua, Spokane Valley, Wa
Peters, David, Cheney, Wa
Pierre, Jennifer, Spokane, Wa
Railton, Kimberly, Spokane, Wa
Rosimo, Bianca, Bremerton, Wa*
Rowe, Raeann, Union Gap, Wa
Shepherd, Travis, Spokane, Wa
Sizov, Philip, Spokane Valley, Wa
Stephenson, Lisa, Spokane, Wa
Stohler, Paulette, Bellevue, Wa*
Tuohy, James, Spokane, Wa
Znovets, Olga, Spokane Valley, Wa

Bonde, Jodi, Milwaukee, Wi*
Frederickson, Christopher, Rhinelander, Wi*
Friemoth Parker, Nicole, Neillsville, Wi*
Hahn, Erin, Boyceville, Wi
Haines, Kelly, La Crosse, Wi*
Hicks, Kristy, Rhinelander, Wi*
Hoffman, Chris, Lodi, Wi
Kraft, Nicholle, Altoona, Wi
Kroening, Donna, Colby, Wi*
Lee, Kjerstin, Menomonie, Wi
Medina, Joana, Neillsville, Wi*
Pederson, Janet, Mondovi, Wi
Peterson, Carly, Chippewa Falls, Wi
Reinart, Rachel, Neillsville, Wi*
Stephens, Angela, Saint Francis, Wi*

Baldwin, Erin, Wellsburg, WV
Ball, Kaitlin, Charleston, WV
Beerbower, Brittney, Bruceton Mills, WV
Browning, Joshua, Nitro, WV*
Chestnut, Miranda, Belle, WV*
Cochran, Rachel, Weston, WV
Comi, Lauren, Morgantown, WV*
Conley, Brittany, Rivesville, WV
Cronin, Ashley, Bridgeport, WV
Dalton, Brittani, Morgantown, WV
Devores, Donna, Monongah, WV
Gilmore, Rikki-Lyn, Moundsville, WV
Hamlett, Lisa, Fairmont, WV
Hanshaw, Brittany, Summersville, WV
Harney, Margaret, Fairmont, WV
Harris, Michael, New Cumberland, WV
Hines, Erica, Masontown, WV
Jahn, Brittany, Fairmont, WV
Larew, Brittany, Newburg, WV
Long, James, Buckhannon, WV*
McCoy, Joseph, Wellsburg, WV
McDonald, Allauna, Fairmont, WV
Miller, Heather, Mannington, WV
Mitchell, Ashley, Philippi, WV
Moore, Nadine, Wheeling, WV
Murphy, Ashlee, Fairmont, WV
Myers, Samantha, Reynoldsville, WV
Prout, Elizabeth, Wheeling, WV
Ruppert, Brittany, Salem, WV
Schmidt, Lisa, Chester, WV
Schreiner, Joel, Weirton, WV
Smith, Wilma, Ripley, WV*
Snider, Sara Jo, Wheeling, WV*
Stover, Sherry, Belington, WV
Swint, Sara, East Bank, WV*
Tenney, Tina, Rivesville, WV
Uselton, Kortnie, New Cumberland, WV
Wade, Chastane, Moundsville, WV
Walker, Tracey, Ronceverte, WV*
Wojceichowicz, Valerie, Hernshaw, WV*

Brooks, Marla, Gillette, Wy
Buck, Rachel, Casper, Wy
Cheney, Patricia, Cheyenne, Wy*
Eichenberger, Kimberly, Casper, Wy
Green, Desiree, Evansville, Wy
Hurt, Lucas, Casper, Wy
McClintock, Michelle, Casper, Wy
Milby, Amber, Casper, Wy
Morton, Malorie, Casper, Wy*
Pickett, Peggy, Casper, Wy
Price, Makensi, Bar Nun, Wy
Sherwin, Thomas, Casper, Wy
Sjulestad, Jordan, Casper, Wy

Military Members

Colache, Anthony, Travis AFB, Ca*
Hackler, Sadie, Travis AFB, Ca*
Marante-Fisher, Yvonne, APO, AP*

International Members

Agmy, Gamal, Assint, Egypt
Al Dalgan, Bashair, Riyadh, Saudi Arabia
Al Dalgan, Manar, Damman, Saudi Arabia
Al-Halfawy, Ahmed, Cairo, Egypt
Al-Zahrani, Abdullah S, Jeddah, Saudi Arabia
Almasallam, Ali, Riyadh, Saudi Arabia *
Alsayari, Omar, Jeddah, Saudi Arabia
Coulter, Jason, Vernon, BC, Canada
El Batanouny, Mahmoud, Cairo, Egypt
El Esawy, Assem, Giza, Egypt
El-Sorougi, Waleed, Cairo, Egypt
Emam, Raef, Giza, Egypt
Farag, Shaheer, Cairo, Egypt
Forsdahl, Bard, Tromsoe, Norway
Gad, Ahmed, Alexandria, Egypt
Haley, David, Cambridge, On, Canada
Kamel, Mohamed, Cairo, Egypt
Korraa, Emad, Cairo, Egypt
Libbey, Suzanne, Calgary, Ab, Canada
Margueron, Dayane, Preverenges, Switzerland
Markussen, Heidi, Bergen, Norway
Masoud, Hossam, Cairo, Egypt
Mostafa, Yasser, Cairo, Egypt
Okba, Ashraf, Cairo, Egypt
Oliverio, Jennifer, Calgary, Ab, Canada
Peryea, Allie, Santa Rita, Guam
Smajlovic, Almir, Windsor, On, Canada
Sol, Senta, Vernon, BC, Canada
Uysal, Mehmet Atilla, Istanbul, Turkey
Vold, Monica Linea, Tromsdalen, Norway
Wagih, Khaled, Cairo, Egypt
Yaqubi, Parwiz, Longeueil, Qc, Canada
Zidan, Mohamed, Alexandria, Egypt

American Association for Respiratory Care Presents

Continuing Education from the Best...
PROFESSOR'S ROUNDS IN RESPIRATORY CARE 2013

Professor's Rounds is your choice to ensure that you and your staff learn the latest information from internationally recognized experts.

Each program meets licensure and Joint Commission continuing education requirements. Earns each participant one CRCE per program. All with access to internationally recognized experts in respiratory care in the convenience of your own facility, no travel. Each one hour DVD program includes handouts of the presenter's slides and a continuing education packet.

FOR COMPLETE DESCRIPTIONS, VISIT THE AARC BOOTH IN THE EXHIBIT HALL

- **VAP to VAE: Implication for the Respiratory Therapist - Ventilator Associated Events**
  By Dean Hess, PhD RRT FAARC and Kathleen Deakins, MHA RRT-NPS FAARC
- **Oxygen Therapy in the Hospital**
  By Keith Lamb, RRT and Dean Hess, PhD RRT FAARC
- **Caring for Patients with Chronic Critical Illness**
  By Shannon Carson, MD and Neil MacIntyre, MD, FAARC
- **Cystic Fibrosis - A 21st Century Perspective**
  By Elliot Dasenbrook, MD, MHS and Timothy R. Myers, MBA RRT-NPS
- **Medicated Aerosol Therapy – New Drugs and Devices**
  By Douglas S. Gardenhire, EdD RRT-NPS and Tom Kallstrom, MBA RRT FAARC
- **Airway Clearance**
  By Timothy R. Myers, MBA RRT-NPS and Richard Branson, MSc RRT
- **Optimizing Patient-Ventilator Synchrony**
  By Robert Kacmarek, PhD RRT FAARC and Tom Kallstrom, MBA RRT FAARC
- **Humidification During Mechanical Ventilation – A Review of the Literature**
  By Richard D. Branson, MSc RRT and Doug Laher, MBA RRT

Delivery Dates and Order of Shipping to Be Determined.

ENTIRE SERIES OF 8 PROGRAMS — BEST VALUE
Order Item PR2013S
Nonmember Price $1,605
MEMBER PRICE $1,420 – *MEMBERS SAVE $185*
(Plus shipping and handling.)

SINGLE PROGRAM PURCHASE PRICE
Nonmember Price $295
MEMBER PRICE $265 – *MEMBERS SAVE $30*
(Plus shipping and handling.)

ORDER THE ENTIRE 2013 SERIES AND SAVE!

AMERICAN ASSOCIATION FOR RESPIRATORY CARE
www.AARC.org • info@aarc.org • 972-243-2272 • Fax 972-484-2720
9425 North MacArthur Blvd. Suite 100, Irving, Texas 75063 USA

AARC Times Classified Advertising Information & Requirements:

Classified Word Advertisements

AARC Members: $50 for 50 words or less; each additional word, $1. Free Internet placement. Nonmembers: $60 for 50 words or less; each additional word, $1.20. Listings are categorized by state. Following the state listings are United States/International, For Sale/For Rent, Miscellaneous, and Situations Wanted. All copy should be typed double-spaced. All ads will be set in 8-point type. To calculate the cost per advertisement, a "word" is considered to be one or more letters, numbers, or special characters with a space before and after.

Ads are featured on the AARC website for one month after publication. Ad may only be placed on the website with an insertion order for placement in an AARC publication. Ad is noncancelable after placement on the website. NOTE: *AARC Times* reserves the right to refuse any advertisement not directly relevant to respiratory care. *AARC Times* does not endorse any advertiser, its positions, practices, services, or products.

We reserve the right to make editorial changes for reasons of clarity and consistency. Every effort is taken to avoid mistakes, but *AARC Times* cannot be responsible for clerical or printing errors. **Deadline for Ad Placement/Cancellation** Deadline for ad placement and written cancellations for the next available issue is December 17. Blind ads available. **For Recruitment Advertising Information, Contact Classified Advertisement** Andrea Conté • Alhambra Plaza • 725 N. Highway A1A, Suite C-106 • Jupiter, FL 33477 • (561) 745-6793 • Fax (561) 745-6795 • AARCAD@aol.com

Recruitment Display Advertisements

For Recruitment Display Ad Rates, go to www.aarc.org/marketplace/media_kit/recruitment_12.pdf, or contact Tim Goldsbury and Associates, Alhambra Plaza, 725 N. Highway A1A, Suite C-106, Jupiter, FL 33477, (561) 745-6793, Fax (561) 745-6795

Make a Difference in Patient Care

When You Enhance Your Knowledge of Alpha-1 Antitrypsin Deficiency

More than 90,000 Americans are estimated to have Alpha-1 Antitrypsin Deficiency (Alpha-1). Since it is associated with COPD, you can play an important role as a respiratory therapist in its identification and treatment. This online course from the AARC is aimed at significantly improving your knowledge of this under-recognized disease. It will be a useful tool as you diagnose and care for patients with Alpha-1.

NEW ONLINE COURSE FROM THE AARC!

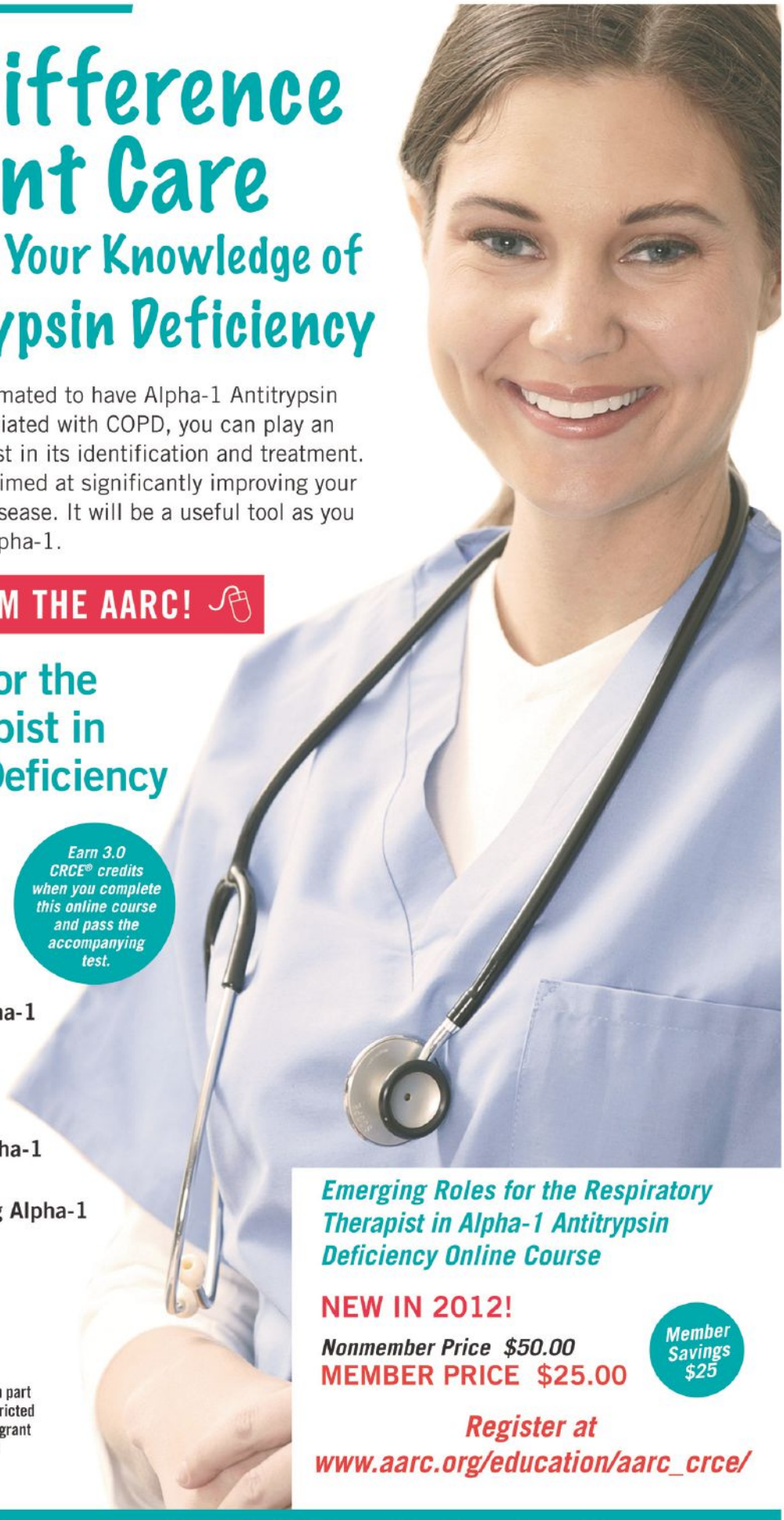
Emerging Roles for the Respiratory Therapist in Alpha-1 Antitrypsin Deficiency

This course includes:

- Definition and causes of Alpha-1
- Clinical manifestations of Alpha-1
- Genetics of Alpha-1
- Epidemiology and detection of Alpha-1
- Optimal management of COPD in general
- Augmentation therapy for Alpha-1
- Emerging therapies for treating Alpha-1
- The key role of the respiratory therapist in diagnosing and treating Alpha-1

Earn 3.0 CRCE® credits when you complete this online course and pass the accompanying test.

Presenters:
Charlie Strange, MD
James K. Stoller, MD MS FAARC
Robert Sandhaus, MD PhD



Emerging Roles for the Respiratory Therapist in Alpha-1 Antitrypsin Deficiency Online Course

NEW IN 2012!

Nonmember Price $50.00
MEMBER PRICE $25.00

Member Savings $25

Register at www.aarc.org/education/aarc_crce/

Presented by the American Association for Respiratory Care

Sponsored in part by an unrestricted educational grant from Alpha-1 Foundation

Visit www.aarc.org/education/aarc_crce/ for all AARC continuing education courses.

Calendar of Events

AARC & State Society Programs

July 15–17, 2013
Orlando, FL
AARC Summer Forum
Contact AARC, (972) 243-2272,
www.aarc.org/education/meetings

October 20–26, 2013
Respiratory Care Week
Contact AARC, (972) 243-2272,
www.aarc.org/rcweek

October 23, 2013
Lung Health Day
Contact AARC, (972) 243-2272, www.aarc.org

November 16–19, 2013 (Saturday–Tuesday)
Anaheim, CA
AARC Congress 2013
Contact AARC, (972) 243-2272,
www.aarc.org/education/meetings

Submissions for the next available issue are due December 19.

For information on submitting calendar events, contact: Beth Binkley, AARC Times, 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706 (972) 243-2272 Fax (972) 484-2720 Email binkley@aarc.org

Advertiser Index

To advertise, contact: Tim Goldsbury, Advertising Sales, Alhambra Plaza, 725 N. Highway A1A, Suite C -106, Jupiter, FL 33477, (561) 745-6793, Fax (561) 745-6795, goldsbury@aarc.org. Or contact Beth Binkley, Advertising Assistant, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706, (972) 243-2272, Fax (972) 484-2720, binkley@aarc.org

Proportional Pressure Ventilation — noninvasively. Can your ventilator do that?

Different patients have different breathing needs, and Philips remains committed to finding innovative new ways to address them. With the incorporation of a proportional pressure ventilation (PPV) mode within our Respironics V60 system, you can now perform PPV noninvasively. To learn more about how the Respironics V60 is taking NIV even further, visit www.philips.com/V60.

PHILIPS

sense and simplicity

Acoustic Respiration Rate

Accurate > Easy to Use > Patient-Tolerant

Introducing rainbow Acoustic Monitoring™

Masimo rainbow® Acoustic Monitoring noninvasively and continuously measures respiration rate (RRa™) using an adhesive acoustic sensor. After the sensor is easily and comfortably applied to the patient's neck, RRa helps clinicians continually assess the patient's respiratory rate.

rainbow Acoustic Sensor™

www.masimo.com
1-800-257-3810

MASIMO